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REPORT OF THE BOTANIST

ON THE

GRASSES AND FORAGE PLANTS,

AND THE

CATALOGUE OF PLANTS.

BY
CHARLES E. BESSEY
AND
HERBERT J. WEBBER.

EXTRACTED FROM THE REPORT OF THE
NEBRASKA STATE BOARD OF AGRICULTURE
FOR 1889.

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THE GRASSES AND FORAGE PLANTS OF NEBRASKA.

BEING THE ANNUAL REPORT OF THE BOTANIST, BY CHARLES E. BESSEY, PH. D.

Gentlemen of the State Board of Agriculture: I have the honor of submitting to you my annual report as your official botanist for the year 1889.

I.—FIELD WORK.

During the year I made a short examination of the grasses and forage plants of the elevated region of the northwestern part of the state, particularly of Box Butte and Dawes counties. Incidentally a good many observations were made upon the vegetation of the region traversed in going to and returning from the counties particularly visited. Between Lincoln and Grand Island the ordinary cultivated grasses and clovers are abundantly grown. In Seward, York, and Hamilton counties I saw fine fields of red clover and timothy. Some of these were equal to any I have ever seen in any part of the United States. Beyond the Platte river the cultivated grasses decrease rapidly, the country being still quite new, but stray plants of clover and timothy seen here and there show that these will do well when the farmer once turns his attention to their growth. In Custer county fine fields of timothy and clover were seen.

Box Butte county is still so new that but little has been done in the way of introducing the cultivated grasses and forage plants, and thus far the wild grasses have been almost the only ones used for either hay or pasturage. A few fields of Hungarian grass or millet were seen in a drive of about thirty miles across the country from Alliance northwestward. The country here is an elevated plain upwards of 3,000 feet above the level of the sea. The surface of the ground is covered with close turf composed of Buffalo grass, Wheat grass, Gramma, and several others, which will be more particularly noticed in a subsequent portion of this paper.

In Dawes county, north of the Niobrara river, the surface becomes quite broken and upon Pine Ridge rises to an altitude of about 4,600 feet above sea-level. North of this ridge the surface descends abruptly to the valley of the White river. All over this mountain ridge there is a good turf of grass, including Buffalo grass, Gramma, Blue Stem, and Porcupine grass, the latter very abundant. A feature of Pine Ridge which is full of interest, although it does not bear directly upon the particular topic under discussion, is the considerable growth of pines in the canons and upon the ridges and slopes.

In the month of August I had occasion to visit Red Willow county, and while there took occasion to examine the grasses in the vicinity of Indiadola and Bartley with some care. The valley of the Republican river here has an elevation of about 2,350 feet, while back upon the highlands the elevation is near to 2,500 feet above sea-level. In the valley the grass vegetation is exceedingly abundant, and includes all the well known wild grasses of the state, such as Buffalo grass, Gramma, Mesquite grass, Wild Wheat grass, Blue Stems, etc., etc. Along the river I found rank growths of the Great Reed grass (*Phragmites communis*), a grass of little agricultural value, but of marked interest to everyone on account of its great size. Specimens collected at this time measured upwards of eight feet in height, showing that the climate is by no means as dry as has been supposed. Clover and timothy were observed in several fields, and in places fine growths of alfalfa, demonstrating the adaptability of this excellent forage plant to this soil and climate.

During the summer, Mr. Webber, my assistant in the botanical department of the University, made an extensive botanical tour through the counties of Custer, Thomas, Box Butte, Dawes, and Sioux, and, at my request, he gave especial attention to the native grasses of the regions he visited. His results will be given in a subsequent section.

In the autumn, Mr. J. G. Smith, the assistant agriculturist of the Experiment Station, visited the counties of Box Butte and Cheyenne in order to study the native grasses. His results, which are valuable, are included in a subsequent section.

By this field work we have extended our knowledge of the native grasses of Nebraska very materially. Nearly, if not quite, one-half of the counties of the state have been personally visited, and observations of greater or less importance have been made in them.

II.—THE GRASSES OF CENTRAL NEBRASKA.

(*By Herbert J. Webber.*)

This summer [1889], while on a collecting trip for the Department of Agriculture in company with Lawrence Bruner, western entomological agent for the department, I spent several days on the Dismal and Loup rivers, in Thomas county, Nebraska. As this is in the very heart of the so-called barren sand hill region, a few notes especially on the Dismal river grasses may not be without interest.

We started for the Dismal river, of which we had heard much from the settlers, in the early morning of the 12th of July. We were accompanied by Mr. Wright, a farmer of the place (Thedford), and Mr. Harper, a sportsman. For several miles we drove up the valley of the Middle Loup river, here a stream about fifty feet wide, averaging three feet deep, and with a remarkably swift current (about eight miles an hour). The valley is usually about half a mile wide, and is the pasture and meadow region of the immediate country. The grass here is very rank; composed chiefly of Wheat grass (*Agropyrum glaucum* R. & S.), June grass (*Koeleria cristata* Pers.), Wild Rye (*Elymus canadensis* L.), Switch grass (*Panicum virgatum* L.), Prairie grass (*Eatonia obtusata* Gray), etc., intermixed with sedges, and in places with rank growths of several ferns (*Onoclea sensibilis* L., and *Aspidium thelypteris* (L.) Swartz.). The deer appreciate this rich pasturage, and even now frequently come down from the hills at night to enjoy it. Along the railroad up the valley I collected a bunch of Paspalum (*Paspalum setaceum* Michx.). It is evidently rare here, probably having but lately been introduced. I should not consider it a very valuable addition in an economic sense.

In some rather open places I observed bunches of Barley grass (*Hordeum nodosum*). Mr. Wright pronounces this grass worthless. In a prairie dog town in the valley, where the larger grasses are kept down, and the sod in places somewhat torn up and packed by the continual tramping, I found quite commonly bunches of the False Buffalo grass (*Munroa squarrosa* Torr.) and the common Stink or Candy grass (*Eragrostis major* Host.). The former, I notice, frequents such places and will likely become a "waste place" grass. At the edge of a little pond on the damp bank and extending into the water to where it was nearly a foot deep, the rare Mountain Water grass (*Catabrosa aquatica*) was discovered.

We soon left the bottom lands and began climbing the sand hills up over the divide. From all that I had heard of them I expected now a long, tedious ride, but not so. I was surprised at the great variety of flowers we found. We were kept constantly busy pointing out the different kinds and watching the flight of insects. At times we wearied our driver not a little by the frequency of our stops, although for a farmer he was quite a naturalist. The grasses on the sand hills are by no means so rare as one might suppose them to be judging by the common expression, "the barren sand hills!" The Gramma (*Bouteloua oligostachya* Torr.), Porcupine grass (*Stipa comata*), Little Blue Stem (*Andropogon furcatus*), Big Blue Stem (*Andropogon provincialis*), Sand grass (*Calamagrostis longifolia* Hook.), and the Wheat grass (*Agropyrum glaucum*) are, perhaps, the prevailing grasses. The last four are frequently quite badly rusted (*Puccinia graminis* Pers., which forms numerous little black or brownish powdery spots about the size of a pin head on the stems and leaves). The Prairie grass (*Sporobolus cryptandrus* (Trin.) Gr.), is in places quite common. Mr. Wright tells me that this is a fine pasture grass. It, also, is very frequently rusted (*Puccinia sporoboli* Arth.)

Our driver told us that we might look for antelope and deer on the divide, but although we saw numerous signs, perhaps fortunately for the scientific interest of our trip, we could discover nothing more.

As we approached the divide the region became more hilly, and from here on till we reached the Dismal river, grew constantly more undulating, until, with the sand and increasing heat, travel became very tedious. Mr. Bruner's hands, face, and neck were burned to a blister by the hot sun, and mine were no better. About two o'clock in the afternoon, much to our satisfaction, we suddenly emerged from the hills, and descended, at first gradually, then abruptly, into the valley of the Dismal river, our destination. We had ridden some twenty miles through sand hills, had seen but one house,— a deserted sod shanty,— and not a sign of water.

The appearance of Dismal river at this point is very striking. A half mile away one would never suspect the presence of more than a small "draw" at most, but soon one begins a rapid descent, and suddenly we look over a small bluff, and there below us a hundred feet spreads out the green valley of the Dismal river. A small valley, indeed, here only about seven hundred feet in width, but from its location the most interesting I have ever visited. Turn this way, and one sees only sand hill after sand hill, stretching away as far as the eye can reach, the air over them quivering with the heat of an almost tropical sun; face about, and there below is a green wooded belt, with an underbrush in places forming almost a jungle, and, winding in and out, a clear, rippling stream. The coolness of the shaded valley seems to come rolling up in waves, enveloping the hot and tired collector as he gazes.

The bluffs on the south side of the valley rise abruptly to the height of almost three hundred feet. At one time they were heavily wooded with the red cedar (*Juniperus virginiana* L.), of which a few remain, but settlers for miles around depend upon this for their fuel and postwood. The brush from cut trees was thrown in rows, about a rod apart, extending up the bluffs, and a fire lately burned over great patches of this, doing much damage to standing trees, so that now from a distance the bluffs present a striking black and grayish-striped appearance.

Almost in the edge of the water rank stems of Water grass (*Glyceria arundinacea* Kunth.), three feet high, and with a panicle about sixteen inches long, were gathered. This is not a rare species in many places, but has not been noted before for Nebraska. Near this, and still in the edge of the water, we gathered specimens of the other smaller Water grass (*Glyceria nervata* Trin.), and the common switch grass (*Panicum virgatum* L.).

In the woods specimens of Wild Rye (*Elymus striatus* Willd.) and Mountain Red Top (*Agrostis exerata* Trin.) were collected. A rather rare Water grass (*Oryzopsis micrantha* (Trin. & Rupr.) Thurb.) grew in the edge of a pond, and near it, on wet, sandy soil, Water Fox-tail (*Alopecurus geniculatus* L. var. *aristulatus* (Michx.) Torr.)

While walking along the edge of the bluffs on the south side to investigate the "blow-outs," we made some excellent finds. Right in the blow-outs where almost nothing else grew we found quite commonly bunches of Blow-out grass (*Redfieldia flexuosa* Vasey (Torr. Bull., July, 1887). Another somewhat rare Blow-out grass (*Eragrostis tenuis* (Ell.) Gray) was found to be quite common here. The former has heretofore been reported only from Colorado and Canadian river so far as I can ascertain; both were also found in Nebraska this summer near Valentine. Bunches of a Muhlenberg grass (*Muhlenbergia pungens* Thurb.) were also common, and are found usually hanging over just at the edge of the "blow-outs."

On the hillsides, patches of Buffalo grass (*Buchloe dactyloides* Engelm.) frequently occur. Bushy Blue Stem (*Andropogon nutans* L.), Western Beard grass (*Aristida purpurea* Nutt.), and bunches of Wire grass (*Schedonnardus texanus* Steud.) were gathered in quantity. A glaucous variety of the Switch grass (*Panicum virgatum* L. var. *glaucum* Vasey) is frequently met with here. It is smaller, covered with a whitish bloom, and has a more simple, less branched spike than the usual form. Down by the edge of the water, when on our road back, we noticed quantities of the Marsh Cord grass (*Spartina cynosuroides* (L.) Willd.). This is a common grass throughout the state, but is of no agricultural value. Other grasses were found, but these will suffice to show that "the sand hills" are not so barren as the name would indicate.

III.—THE GRASSES OF NORTHWESTERN NEBRASKA.

(*By Herbert J. Webber.*)

During last summer (1889) I spent two weeks in botanical collecting at Belmont, on "Pine Ridge," Dawes county, Nebraska, from about July 15th to the 31st; and the week following in Harrison and Hat Creek basin, 20 miles northwest of Harrison, Sioux county. The whole of this northwestern region of Nebraska is mountainous, ranging in altitude, in Dawes county, from 3,900 feet in White river valley to about 4,900 or 5,000 feet on the bluffs of "Pine Ridge;" and in Sioux county from about 4,300 feet in the Hat Creek basin to about 5,200 feet on the highest points of "Pine Ridge." The flora of the two places, particularly the grass flora, is very similar, being mountainous in character. The prairie grasses here are similar to the upland grasses of the "sand hills," but the sod is more compact, indicating better adaptability and richer soil. It is difficult to tell what ones are the most common. Wheat grass (*Agropyrum glaucum* R. & S.), Porcupine grass (*Stipa comata* Trin. & Rupr.), Sand grass (*Calamagrostis longifolia* Hook.), Big Blue Stem (*Andropogon provincialis* Lam.), Turkey-foot grass (*Andropogon hallii* Hack.), Little Blue Stem (*Andropogon scoparius* Michx.), Gramma (*Bouteloua oligostachya* Torr.), Salt grass (*Distichlis spicata* (L.) Green var. *stricta* Thurb.), and June grass (*Koeleria cristata* Pers.) probably predominate and are the principal grasses of the uplands and unwooded valleys. In Hat Creek basin I examined the flourishing meadows of the Circle Bar ranch that are watered by irrigation, and found these grasses to make up the bulk of the hay. The grass on the prairie is usually quite light, but this irrigated meadow presented an agreeable contrast. It must not, however, be thought that the prairies are barren, for they are not. Thousands of cattle feed "on the range" now, as the myriads of buffaloes did before their extermination. Conditions are, however, changed. The Buffalo grass (*Buchloe dactyloides* Engelm.), that during the time of the buffalo is said to have been *the grass* of the prairie, is fast disappearing even in this western region.

Other grasses occur quite commonly and in some cases are quite valuable. The Switch grass (*Panicum virgatum* L.) is in some localities quite common, but is not so important a factor as it is in the central and eastern regions, but I think that while this is said to be a valuable grass, in general, it does not figure very prominently, anywhere in Nebraska, except, perhaps, in the eastern portion, where it has become in places a noxious weed. *Oryzopsis cuspidata* is common along roads and in open places, but is, I think, a worthless grass.

Bunches of Bunch grass (*Sporobolus asperifolius* (N. & M.) Thurb.), Beard grass (*Aristida purpurea* Nutt. and *A. purpurea* var. *hookeri* Tr.), Wire grass (*Schedonnardus texanus* Steud.), and Panic grass (*Panicum scoparium* Lam.) are usually scattered over the prairie; but as grazing grasses they are of but little value, being usually shunned by cattle in pastures. Bushy Blue Stem (*Andropogon nutans* L.) is a valuable grass and wide spread, but is seldom very thick on the ground, other grasses on the prairie seeming to crowd it out and hinder it from spreading.

The canons around Belmont are usually small, and are wooded with Pine, Box-elder, Cottonwood, Hackberry, etc. They are of but little use for grazing purposes, but furnish quite a number of interesting grassess. Oryzopsis (*Oryzopsis micrantha* (Trin. & Rupr.) Thurb.), Wild Chess (*Bromus kalmii* Gray and *B. kalmii* var. *poteri* Coulter), Hairy Brome grass (*Bromus ciliatus* L.) Brome grass (*Bromus breviaristatus* Thurb.), Wild Rye (*Elymus striatus* Willd.), and Muhlenberg's grass (*Muhlenbergia racemosa* (Michx.) B. S. P.) are found commonly in the woods of the canons. A few specimens, also, were collected of Oregon Blue Grass (*Poa tenuifolia* Nutt.), Mountain Spear grass (*Poa andina* Nutt.), Blue grass (*Poa memoralis* L.), Eatonia (*Eatonia pennsylvanica* (Spreng.) Gray) and a wood Wheat grass (*Agropyrum tenerum* Vasey), growing in damp, shaded places, but they are rare.

The canons of "Pine Ridge" in Sioux county, surrounding Hat Creek basin, are some of them large enough to furnish considerable pasturage. In some that were wet I walked through rank meadows containing chiefly Wheat grass (*Agropyrum glaucum* R. & S.), Yellow Top (*Calamagrostis stricta* Trin.), Red Top (*Agrostis alba* L.). Mountain Red Top (*Agrostis exerata* Trin.) intermingled with other less common grasses, with sedges and rushes of various kinds. In all of these wet canons by the water's edge we find the pretty ribbed Water grass (*Glyceria nervata* (Willd.) Trin.) During the heat of the day cattle can retire to these canons for shade, and find also abundant pasturage and water.

IV.—GRASSES OF BOX BUTTE AND CHEYENNE COUNTIES.

(*By Jared G. Smith.*)

August 21st I started from Alliance, Neb., on a short trip of observation to determine particularly the *grass flora* of southern Box Butte and northern Cheyenne counties.

Alliance lies on a broad level plain which appears to have been at one time the bed of a lake. Southward and eastward, from eight to ten miles distant, are the sand hills. To the west is the broad valley of Snake creek, a creek which, like nearly all the streams of this region, flows from the sand, rushes rapidly forward a few miles and disappears, losing itself in the sand. North and northwestward the land rises toward Pine Ridge. The only apparent outlet of this lake basin is toward the east in a pass through the sand hills.

On this level plain, parched and barren under the August sun, the principal grasses found were Gramma, *Bouteloua oligostachya* Torr., and its near relative *Bouteloua hirsuta* Lag.; Buffalo grass, *Buchlœ dactyloides* Englm.; Wild Wheat grass, *Agropyrum glaucum* R. & S., and two others very common but of no agricultural value, a Beard grass, *Stipa sp.* —, near *comata* Trin., and Prairie Wire grass, *Schedonnardus texanus* Steud.

The great bulk of the prairie grass was Gramma, and I was told that it is *the* pasture grass of the region.

On the morning of August 21 I went in company with Mr. Nelson Fletcher, of Alliance, to a natural meadow of about 350 acres lying in the Snake creek valley just at the foot of the sand hills southeast of the town. The ground was wet but not swampy, and the rank plant growth which covered it formed a pleasing contrast with the sweltering sandy slopes around the meadow. The chief grass was *Agropyrum glaucum*, which differed from the form found near Lincoln in having longer and less harsh leaves. Mixed with it were *Andropogon scoparius* Michx., *A. provincicialis* Lam., *Muhlenbergia glomerata* Trin., *Elymus canadensis* L., and *Panicum virgatum* L. With these grasses were tall golden rods, and purple blazing stars and white flowered asters, altogether making a brilliant flowery oasis in a sandy desert. The growth was very even, from two and one-half to four feet high. Mr. Fletcher said though no hay is cut on the open prairie, enough is obtained from these natural meadows, and it is hay of very good quality, so that the average price ranges from two to four dollars per ton.

About a mile east of this meadow stood what appeared to be a large field of corn, but which on near approach proved to be Reed grass, *Phragmitis communis* Trin.

This grass and cat-tails and rushes were quite common on the swampy meadows and around the numerous small lakes of the sand hill region.

Along the valley of Snake creek I found, in addition to those already mentioned,
Andropogon nutans L., bushy blue joint,
Oryzopsis cuspidata Benth., bunch grass,
Sporobolus airoides Torr., a small tumble weed,
S. vaginæflorus Vasey,
S. asperifolius N. & M.,
S. asper Kth.,
Panicum capillare L., old Witch grass,
Setaria glauca Beauv., Fox-tail,
S. viridis Beauv., green Fox-tail,
Deyeuxia canadensis, Beauv., Sand grass,
Distichlis maritima Raf., Salt grass, and
Spartina cynosuroides Willd., Cord grass.

In the sand hills around Alliance the principal grasses are:
Andropogon hallii Hack., Turkey foot,
Sporobolus asper Kunth.,
Oryzopsis cuspidata Benth,
Bouteloua oligostachya Torr.,
Deyeuxia canadensis Beauv.,
Eragostis tenuis Gray,
Andropogon provincialis Lam.,
Andropogon nutans L.,
Andropogon scoparius Michx.,
Stipa comata Trin., and on the higher hills and particularly noticeable at the edges of the "blow-outs," *Muhlenbergia pungens* Thurb.

In the clear white sand in the "blow-outs" *Redfieldia flexuosa* Vasey is found quite abundantly.

NOTES.—The best grazing grasses are Gramma and Buffalo grass.

Wild wheat grass is good for hay but not for pasture.

Sporobolus asperifolius grows only in wet places.

The natural meadows yield one and one-half to two and one-half tons per acre.

The sand hill grasses are *Andropogon hallii*, *Deyeuxia canadensis*, with *Muhlenbergia pungens* and *Redfieldia flexuosa* about the "blow-outs."

I did not find sand-burs, but on sitting down to rest on a sandy knoll I found its place amply supplied by Mamillaria.

From Alliance I went west along Snake creek valley twelve or fifteen miles, then southwest through the extreme western extension of the sand hills till I struck the old Black Hills trail at the head of Red Willow canon, and thence down the Red Willow southeast to the Platte. The only new find was *Munroa squarrosa* Torr., on the Platte side of the divide. *Oryzopsis cuspidata*, which at Alliance is found very sparingly, occurs quite abundantly in the Platte valley.

From Camp Clarke on the Platte I went south to Court House rock and Pumpkin creek. The rock is a great mass of argillaceous, light-brown sandstone which rises about 300 feet sheer above the level valley at its base.

The ridge stretching westward, of which Court House rock was once a part, at one time bore a forest of pine and and cedar. Now there are only some stumps and a few scattered trees to show what has been before. In the canons at the foot of Court House there were a number of woody shrubs and vines.

On the summit of the rock I found
Oryzopis cuspidata Benth.,
Agropyrum glaucum R. & S.,
Aristida purpurea Nutt.,
Bouteloua racemosa Lag.,
B. oligostachya Torr.,
Muhlenbergia pungens Thurb., and *Sporobolus cuspidata.*

By the side of the creek at the base of the rock I found
Eatonia obtusata Gr.,
Elymus canadensis Linn.,
Panicum virgatum L.
P. crus-galli L., and
P. crus-galli L. var. *hispidum* Gray,
Aristida purpurea Nutt.,
Bouteloua oligostachya Torr.,
Munroa squarrosa Torr.,
Oryzopis cuspidata Benth.
Sporobolus airoides Torr., and
Cenchrus tribuloides L., sand-burs.

The sand burs have probably been introduced in the Pumpkin creek valley in the wool of sheep which have been herded there.

NOTES.—I did not find *Munroa* north of the Platte valley.

I found *Andropogon hallii* only on the foot hills. These hills are sandy, but are not true "sand hills" as that name is applied in the West.

Distichlis maritima! is the chief pasture grass of the Platte valley around Camp Clarke.

Other grasses, *Buchloe dactyloides*, *Bouteloua oligostachya*, *Spartina cynosuroides*, *Agropyrum glaucum*, *Hordeum jubatum*, *Setaria glauca*, *S. viridis*, *Panicum crus-galli*, and *Munroa sqarrosa* also occur, but they only form local patches, compared with *Distichlis.*

I visited from fifteen to twenty of the islands of the Platte and made two interesting finds. They were *Glyceria distans* Wahl. and *Sporobolus depauperatus* Torr.

The characteristic plant of these islands is the buffalo berry, a thorny, shrubby tree, *Shepherdia argentea* Nutt.

V.—GRASSES AT THE STATE FAIR.

At my request, Mr. Herbert J. Webber, my assistant in the department of botany in the University, made a careful examination of the collections of grasses at the State Fair held in September, 1889. He has prepared the following lists of the species included in the several collections:

THE SOUTHEASTERN REGION.

LANCASTER COUNTY.

Exhibitor, J. D. Woods, of Lincoln.

Wild Rye (*Elymus canadensis* L.).
Wild Rye (*Elymus virginicus* L.).

Squirrel-tail (*Hordeum jubatum* L.).
Wheat grass (*Agropyrum glaucum* R. & S.).
Hairy Brome grass (*Bromus ciliatus* L.).
Sheep Fescue (*Festuca ovina* L.).
Stink or Candy grass (*Eragrostis major* Host.).
Eragrostis (*Eragrostis purshii* Schrad.).
False Red Top (*Eragrostis pectinacea* (Michx.) Gray).
June grass (*Koeleria cristata* Pers.).
Gramma (*Bouteloua oligostachya* Torr.).
Mesquite grass (*Bouteloua racemosa* Lag.).
Wood grass (*Cinna pendula* Trin.).
Hair grass (*Agrostis scabra* Willd.).
Prairie grass (*Sporobolus asper* (Michx.) Beauv.).
Prairie grass (*Sporobolus cuspidatus* Torr.).
Prairie grass (*Sporobolus vaginæflorus* (Torr.) Vasey).
Timothy (*Phleum pratense* L.).
Muhlenberg's grass (*Muhlenbergia racemosa* (Michx.) B. S. P.)
Muhlenberg's grass (*Muhlenbergia mexicana* (L.) Trin.).
Bushy Blue Stem (*Andropogon nutans* L.).
Big Blue Stem (*Andropogon provincialis* Lam.)
Green Fox-tail (*Setaria viridis* (L.) Beauv.).
Yellow Fox-tail (*Setaria glauca* (L.) Beauv.).
Barn-yard grass (*Panicum crus-galli* L.).
Old witch grass (*Panicum capillare* L.).
Panic grass (*Panicum dichotomum* L.).
Switch grass (*Panicum virgatum* L.).

NORTHEASTERN REGION.

CUMING COUNTY.

Exhibitor, Mr. Artman.

Wild Rye (*Elymus canadensis* L.).
Wild Rye (*Elymus striatus* Willd.), a timber species.
Squirrel-tail grass (*Hordeum jubatum* L.). Very common. Worthless.
Wheat grass (*Agropyrum glaucum* R. & S.).
Brome grass (*Bromus ciliatus* L.).
Fescue grass (*Festuca tenella* Willd.).
Wire grass (*Poa compressa* L.).
Blue grass (*Poa pratensis* L.).
Orchard grass (*Dactylis glomerata* L.)
Stink grass or Candy grass (*Eragrostis major* Host.).
Eragrostis (*Eragrostis purshii* Schrad.).
June grass (*Koeleria cristata* Pers.)
Reed grass (*Phragmites vulgaris* (Lam.) B. S. P.).
Gramma grass (*Bouteloua oligostachya* Torr.).
Mesquite grass (*Bouteloua racemosa* Lag.).
Bristly Mesquite grass (*Bouteloua hirsuta* Lag.).

Wire grass (*Schedonnardus texanus* Steud.).
Sand grass (*Calamagrostis canadensis* (Michx.) Beauv.).
Hair grass (*Agrostis hiemalis* (Walt.) B. S. P.).
Prairie grrss (*Sporobolus cuspidatus* Torr.).
Prairie grass (*Sporobolus asper* (Michx.) Beauv.).
Muhlenberg's grass (*Muhlenbergia diffusa* Schreb.).
Muhlenberg's grass (*Muhlenbergia racemosa* (Michx.) B. S. P.).
Porcupine grass (*Stipa spartea* Trin.).
Beard grass (*Aristida purpurea* Nutt.
Canary grass (*Phalaris canariensis* L.).
Turkey-foot grass (*Andropogon hallii* Hack.).
Big Blue Stem (*Andropogon provincialis* Lam.).
Little Blue Stem or Red Stem (*Andropogon scoparius* Michx.).
Wild Rice (*Zizania aquatica* L.).
Sand Bur (*Cenchrus tribuloides* L.). When young, before the burs are formed, it is an excellent grazing grass.
Green Fox-tail (*Setaria viridis* (L.) Beauv.).
Yellow Fox-tail (*Setaria glauca* (L.) Beauv.).
Switch grass (*Panicum virgatum* L.).
Barn-yard grass (*Panicum crus-galli* L.).
Old Witch grass (*Panicum capillare* L.).
Small Panic grass (*Panicum scoparium* Lam.).
Crab grass or Finger grass (*Panicum sanguinale* L.).

CENTRAL REGION.

THOMAS COUNTY.

Exhibitor, Mr. C. C. Wright.

Wild Rye (*Elymus canadensis* L.). This is badly rusted (*Puccinia graminis* Pers.).
Wild Rye (*Elymus striatus* Willd.).
Squirrel-tail grass (*Hordeum jubatum* L.).
Barley grass (*Hordeum nodosum* L.).
Wheat grass (*Agropyrum glaucum* R. & S.).
Wheat grass (*Agropyrum unilaterale* Vasey & Scrib.).
Hairy Brome grass (*Bromus ciliatus* L.).
Wild Chess (*Bromus kalmii* Gray).
Sheep Fescue (*Festuca ovina* L.).
Fescue grass (*Festuca tenella* Willd.).
Blow-out grass (*Redfieldia flexuosa* Vasey).
Water grass (*Glyceria arundinacea* Kunth.).
Ribbed Water grass (*Glyceria nervata* (Willd.) Trin.).
Mountain Spear grass (*Poa andina* Nutt.).
Salt grass (*Distichlis spicata* (L.) Green var. *stricta* Thurb.).
Candy grass or Stink grass (*Eragrostis major* Host.).
Blow-out grass (*Eragrostis tenuis* (Ell.) Gr.).
Mountain Water grass (*Catabrosa aquatica* (L.) Beauv.).

Prairie grass (*Etonia obtusata* (Michx.) Gray).

June grass (*Koeleria cristata* Pers.) Very good hay when cut green.

False Buffalo grass (*Munroa squarrosa* Torr.).

Buffalo grass (*Buchloe dactyloides* Engelm.).

Gramma (*Bouteloua oligostachya* Torr.).

Mesquite grass (*Bouteloua racemosa* Lag.)

Wire grass (*Schedonnardus texanus* Steud.).

Sand grass (*Calamagrostis longifolia* Hook.).

Yellow Top (*Calamagrostis stricta* Trin.).

Red Top (*Agrostis alba* L.).

Hair grass (*Agrostis heimalis* (Walt.) B. S. P.). (*Agrostis scabra* of previous reports.)

Prairie grass (*Sporobolus cuspidatus* Torr.).

Prairie grass (*Sporobolus cryptandrus* (Trin.) Gr.).

Muhlenberg's grass (*Muhlenbergia mexicana* (L.) Trin.).

Muhlenberg's grass (*Muhlenbergia pungens* Thurb.). Valueless.

Muhlenberg's grass (*Muhlenbergia racemosa* (Michx.) B. S. P.) (*Muhlenbergia glomerata* of previous reports.)

Timothy (*Phleum pratense* L.).

Porcupine grass (*Stipa comata* Trin. & Rupr.).

Oryzopsis (*Oryzopsis cuspidata* (Nutt.) Benth.)

Water grass (*Oryzopsis micrantha* (Trin. & Rupr.) Thurb.).

Beard grass (*Aristida purpurea* Nutt.).

Water Fox-tail (*Alopecurus geniculatus* var. *aristulatus* (Michx.) Munro.).

Turkey-foot grass (*Andropogon hallii* Hack.).

Bushy Blue Stem (*Andropogon nutans* L.).

Big Blue Stem (*Andropogon provincialis* Lam.).

Little Blue Stem (*Andropogon scoparius* Michx.).

Cord grass (*Spartina cnyosuroides* (L.) Willd.).

Old Witch grass (*Panicum capillare* L.).

Switch grass (*Panicum virgatum* L.). Mr. Wright calls this Broom Corn grass, and informs me that it is quite a prevalent name.

Small Panic grass (*Panicum scoparium* Lam.).

Bead grass (*Paspalum setaceum* Michx.).

CUSTER COUNTY.

Exhibitors, Mr. Knight and Mr. Brown.

Wild Rye (*Elymus canadensis* L.).

Squirrel tail grass (*Hordeum jubatum* L.).

Wheat grass (*Agropyrum glaucum* R. & S.)

Hairy Brome grass (*Bromus ciliatus* L.).

Fescue grass (*Festuca tenella* Willd.).

Salt grass (*Distichlis spicata* (L.) Green var. *stricta* Thurb.).

Stink or Candy grass (*Eragrostis major* Host.).

Prairie grass (*Eatonia obtusata* (Michx.) Gray).

June grass (*Koeleria cristata* Pers.).

Reed grass (*Phragmitis vulgaris* (Lam.) B. S. P.). This is the *Phragmitis communis* Trin. of previous reports.

Buffalo grass (*Buchloe dactyloides* Engelm.).

Gramma (*Bouteloua oligastachya* Torr.).

Bristly Mesquite (*Bouteloua hirsuta* Lag.).

Wire grass (*Schedonnardus texanus* Steud.). I am told that this is called "*Alkali grass*" in Custer county.

Prairie grass (*Sporobolus cryptandrus* (Trin.) Gr.).

Alkali grass (*Sporobolus arioides* (Steud.) Torr.).

Muhlenberg's grass (*Muhlenbergia racemosa* (Michx.) B. S. P.).

Porcupine grass (*Stipa comata ?* Trin. & Rupr.).

Beard grass (*Aristida purpurea* Nutt.).

Bushy Blue Stem (*Andropogon nutans* L.).

Big Blue Stem (*Andropogon provincialis* Lam.).

Little Blue Stem (*Andropogon scoparius* Michx.).

Cut grass (*Leersia virginica* Willd.).

Wild Rice (*Zizania aquatica* L.). Not very common.

Cord grass (*Spartina cynosuroides* (L.) Willd.).

Sand Bur (*Cenchrus tribuloides* L.).

Yellow Fox-tail (*Setaria glauca* (L.) Beauv.).

Green Fox-tail (*Setaria viridis* (L.) Beauv.).

Old Witch grass (*Panicum capillare* L.).

Small panic grass (*Panicum scoparium* Lam.).

Switch grass (*Panicum virgatum* L.). Very common.

Bead grass (*Paspalum setaceum* Nichx.).

HOWARD COUNTY.

Exhibitors, Mr. N. Baxter, and Mr. Becker, of St. Paul.

Wild Rye (*Elymus canadensis* L.). Very large.

Squirrel-tail grass (*Hordeum jubatum* L.).

Wheat grass (*Agropyrum glaucum* R. & S.).

Blow-out grass (*Redfieldia flexuosa* Vasey).

Mountain Spear grass (*Poa andina* Nutt.).

Candy grass or Stink grass (*Eragrostis major* Host.).

Blow-out grass (*Eragrostis tenuis* (Ell.) Gr.).

Reed grass (*Phragmitis vulgaris* (Lam.) B. S. P.). (This is the *Phragmitis communis* of previous reports.)

Gramma (*Bouteloua oligostachya* Torr.).

Bristly Mesquite grass (*Bouteloua hirsuta* Lag.).

Wire grass (*Schedonnardus texanus* Steud.).

Sand grass (*Calamagrostis longifolia* Hook.). Very large. Badly rusted (*Puccinia graminis* Pers.).

Meadow Tickle grass (*Sporobolus asperifolius* Torr.).

Prairie grass (*Sporobolus cryptandrus* Torr. and Gr.).

Prairie grass (*Sporobolus cuspidatus* Torr.).

Muhlenberg's grass (*Muhlenbergia racemosa* (Michx.) B. S. P.).

Turkey-foot grass (*Andropogon hallii* Hack.).

Big Blue stem (*Andropogon provincialis* Lam.).

Little Blue Stem (*Andropogon scoparius* Michx.).

Bushy Blue Stem (*Andropogon nutans* L.).

Johnson grass (*Andropogon sorghum* Brot. sub. sp. *halepensis* (L.) Hack.). This is said to have escaped in places.

Wild Rice (*Zizania aquatica* L.). I find a smut on the leaf of this very common (*Ustilago lineata* Cke.).

Cord grass (*Spartina cynosuroides* Willd.). This is badly rusted (*Puccinia phragmitis* (Schum.) Korn.). It also has in the ovaries the stroma of the Ergot (*Claviceps purpurea*).

Sand Bur (*Cenchrus tribuloides* L.).

Green Fox-tail (*Setaria viridis* (L.) Beauv.).

Barnyard grass (*Panicum crus-galli* L.). Large.

Crab or Finger grass (*Panicum sanguinale* L.).

Small Panic grass (*Panicum scoparium* Lam.).

Bead grass (*Paspalum setaceum* Michx.

SOUTHWESTERN REGION.

CHASE COUNTY.

Exhibitor, Mr. Bernard.

Squirrel-tail grass (*Hordeum jubatum* L.).

Wheat grass (*Agropyrum glaucum* R. & S.).

Candy grass or Stink grass (*Eragrostis major* Host.).

Salt grass (*Distichlis maritima* (L.) Green, var. *stricta* Thurb.).

False Buffalo grass (*Munroa squarrosa* Torr.).

Buffalo grass (*Buchloe dactyloides* Engelm.).

Gramma (*Bouteloua oligostachya* Torr.).

Mesquite grass (*Bouteloua racemosa* Lag.).

Wire grass (*Schedonnardus texanus* Steud.).

Muhlenberg's grass (*Muhlenbergia racemosa* (Michx.) B. S. P.).

Muhlenberg's grass (*Muhlenbergia pungens* Thurb.).

Beard grass (*Aristida purpurea* Nutt.).

Turkey-foot grass (*Andropogon hallii* Hack.).

Big Blue Stem (*Andropogon provincialis* Lam.).

Old Witch grass (*Panicum capillare* L.).

Switch grass (*Panicum virgatum* L.).

Barn-yard grass (*Panicum crus-galli* L.).

DUNDY COUNTY.

Exhibitor, Mr. L. U. Parsons, of Max.

Wild Rye (*Elymus canadensis* L.).

Wheat grass (*Agropyrum glaucum* R. & S.).

Salt grass)*Distichlis spicata* (L.) Green, var. *stricta* Thurb.).

Candy or Stink grass (*Eragrostis major* Host.).

Prairie grass (*Eatonia obtusata* (Michx.) Gray).

False Buffalo grass (*Munroa squarrosa* Torr.).

Buffalo grass (*Buchloe dactyloides* Engelm.).
Gramma (*Bouteloua oligostachya* Torr.).
Mesquite grass (*Bouteloua racemosa* Lag.).
Bristly Mesquite (*Bouteloua hirsuta* Lag.).
Wire grass (*Schedonnardus texanus* Steud.).
Prairie grass (*Sporobolus cryptandrus* (Trin.) Gr.).
Prairie grass (*Sporobolus asper* (Michx.) Beauv.).
Muhlenberg's grass (*Muhlenbergia racemosa* (Michx.) B. S. P.).
Porcupine grass (*Stipa comata* Trin. & Rupr.).
Beard grass (*Aristida purpurea* Nutt.).
Turkey-foot grass (*Andropogon hallii* Hack.).
Bushy Blue Stem (*Andropogon nutans* L.).
Big Blue Stem (*Andropogon provincialis* Lam.).
Little Blue Stem (*Andropogon scoparius* Michx.).
Green Fox-tail (*Setaria viridis* (L.) Beauv.).
Old Witch grass (*Panicum capillare* L.).
Switch grass (*Panicum virgatum* L.).
Bead grass (*Paspalum setaceum* Michx.).

VI.—NUMBER OF NEBRASKA GRASSES.

From a careful study of the plants in different parts of the state it is now certain that there are more than one hundred species of native Nebraska grasses. In the catalogue prepared by Mr. Webber, and accompanying this report (see Appendix) there are enumerated one hundred and six wild species, besides twenty-two which have been introduced purposely, or otherwise, by man and have subsequently "run wild" to a greater or less extent I am aware that it has repeatedly been asserted that Nebraska contains one hundred and fifty species of grasses, and it may occasion surprise that we now, after so many years of further study, enumerate a good many less than that number. It must, however, be borne in mind that popularly all the sedges and many of the rushes are called grasses. Then, too, the clovers and clover-like plants are usually included under the name of grass. In this report only those are called by that name which are entitled to it in a botanical sense. Were we to add the plants of the other kind mentioned above and all the proper grasses, grown only in fields, our Nebraska "grasses" would number from one hundred and seventy-five to two hundred kinds. However, from the botanical standpoint we must at present give the number at one hundred and twenty-eight. To this we may doubtless hope to add quite a number of species, as we are able to explore more fully all parts of the central and western regions of the state.

VII.—VALUABLE WILD SPECIES.

It may be of use to growers of stock to know how many of the one hundred and thirteen wild grasses have any value as forage. I have taken some pains to examine the specimens and to make inquiries and think it is safe to say that from seventy-five to eighty species are of more or less value. They are as follows :

Wild Rye grass.........*Elymus canadensis*, *E. canadensis* var. *glaucifolius*, *E. condensatus*, *E. sibricus*, *E. striatus*, *E. virginicus*.

Wild Wheat grasses	*Agropyrum glaucum*, *A. repens*, *A. tenerum*, *A. unilaterale*.
Wild Chess grasses	*Bromus breviaristatus*, *B. ciliatus*, *B. erectus*, *B. kalmii*, *B. kalmii* var. *portcri*.
Fescue grass.	*Festuca nutans*, *F. ovina*, *F. scabrella*, *F. tenella*.
Water grasses	*Glyceria arundinacea*, *G. distans*, *G. nervata*.
Blue grasses	*Poa andina*, *P. cæsia*, *P. debilis*, *P. nemoralis*, *P. serotina*, *P. tenufolia*.
Salt grass	*Distichlis spicata*.
Wood grass	*Diarrhena americana*.
	Melica porteri.
Water grass	*Catabrosa aquatica*.
Prairie grasses	*Eatonia obtusata*, *E. obtusata* var. *robusta*, *E. pennsylvanica*.
	Koeleria cristata.
Reed grass	*Phragmites vulgaris*.
Purple grass	*Triodia seslerioides*.
Buffalo grass	*Buchloe dactyloides*
The Grammas	*Bouteloua oligostachya*, *B. hirsuta*, *B. racemosa*.
Sand grasses	*Calamagrostis longifolia*, *C. canadensis*, *C. neglecta*.
	Cinna pendula
Red Top grasses	*Agrostis canina*, *A. exarata*, *A. perennans*.
Prairie grass	*Sporobolus cryptandrus*.
	Brachyelytrum aristosum.
Muhlenberg grasses	*Muhlenbergia comata*, *M. diffusa*, *M. racemosa*, *M. mexicana*, *M. mexicana* var. *filiformis*.
Porcupine grasses	*Stipa comata*, *S. spartea*, *S. viridula*.
	Alopecurus geniculatus, *A. geniculatus* var. *aristulatus*.
Canary grass	*Phalaris arundinacea*.
The Blue Stems	*Andropogon hallii*, *A. nutans*, *A. provincialis*, *A. scoparius*.
	Leerzia oryzöides, *L. virginica*.
Wild rice	*Zizania aquatica*.
	Tripsacum dactyloides.
Switch grass	*Panicum virgatum*.
	Beckmannia erucæformis.
	Paspalum setaceum.

It must not be supposed that these are all of equal value, or that they are all of much value. I have admitted to the foregoing list all, or nearly all, that have any value whatever, either for pasture or for hay. Still there are some which I have rejected that have some value when cut early enough. Then, too, I have omitted all the introduced weedy grasses, many of which have some value for hay when cut at the proper time. These are so abundant, and grow without cultivation, that they might well be added to the foregoing list, bringing it up to nearly ninety species.

VIII.—INTRODUCED GRASSES.

With the advent of white men, and the new conditions which they created, there came many plants which never before grew upon the plains. Some of these were brought to these new fields purposely, but many more came as weedy accompaniments of the farms, yards, gardens, wagon-roads, and railroads. In the following list I have included all the foreign species which I know to grow without cultivation in the state, and, in addition, those that are grown considerably in fields and meadows. I think it will surprise many a man when he learns that there are twenty-seven different kinds of foreign grasses which are already more or less common in the state, and that of this number no less than twenty-two are useful. Indeed, under proper treatment, all but one (Stink grass, *Eragrostis major*) of the weedy species may be made into passable hay.

1. *Useful Foreign Grasses.*

RED TOP (*Agrostis alba* L. and *A. alba* L. var. *vulgaris*).—There are two kinds of Red Top growing in this state, distinguished mainly by a difference in the color of the heads. The first (*A. alba*) is usually of a light color with very little of that reddishness which is so marked in the second (*A. alba* var. *vulgaris*). The second is of more value than the first, and should be sown in preference to it.

Red Top, while starting late in the spring, affords good pasturage for the greater part of the season. (*Beal.*)

For damp or wet lands it is especially valuable, affording a fair crop of hay which has always been considered very desirable for feeding to horses.

MEADOW FOX-TAIL (*Alopecurus pratensis* L.).—This grass is rarely grown with us, but merits a trial upon Nebraska farms. It is likely to be of value upon irrigated lands. Another species (*A. geniculatus* L.), smaller in size, may ultimately have a considerable value in similar localities. Their earliness of appearance will commend them to stock-growers. They demand rich soils.

JOHNSON'S GRASS (*Andropogon sorghum* Brot. var. *halepensis*).—This large, coarse grass is extensively grown in the southern parts of the state. While tender in the north, it may still be grown with profit in many places. It endures droughts well and on that account will doubtless prove of great value to us in many seasons. It may be cut several times each season, and after each cutting it springs up promptly again. Frosts kill it entirely, and so it is usually an annual in the north.

TALL OAT-GRASS (*Arrhenatherum avenaceum* Beauv.).—This tall grass has been tried with success in Nebraska, although not yet generally known to farmers. It is early in its growth, and therefore of great value to the grower of stock. In Kansas and Iowa, where extensive experiments have been made, it is pronounced one of our best farm grasses. In southern Nebraska it has been called "Evergreen grass."

BROME GRASSES (*Bromus* of several species).—Several kinds of Brome grasses are occasionally grown in this state by way of experiment. They are tall growing and yield a good deal of fodder.

ORCHARD GRASS (*Dactylis glomerata* L.).—Although Orchard grass is favorably known to many farmers in Nebraska, it is not as extensively grown as it deserves to be. It is one of the earliest grasses to appear, and it will furnish an abundance of pasturage long before the ordinary kinds grown on the farms. When cut early it makes a good hay, but if allowed to stand too long it is rather hard and wiry. In eastern and southern Nebraska it does well, as actual tests abundantly prove. It is perfectly hardy in all parts of Nebraska.

FESCUE GRASSES (*Festuca* of several species).—Several kinds of Fescue grasses have attracted the notice of farmers in different parts of the country. One of the most favorably known is often called Randall grass, Evergreen grass, English Blue grass, or Tall Meadow Fescue. Botanically it is *Festuca elatior* L. It is of rather tall growth, and is somewhat coarse, but is well liked by domestic animals. On moist soils it does better than upon those which are drier.

RYE GRASSES (*Lolium multiflorum* Lam., and *L. perenne* L.).—These two grasses are well and favorably known abroad, and are grown somewhat in this country. The first is known as Italian Rye grass, and the second as Perennial Rye grass. Being short-lived, they must be renewed frequently; in fact, for the most part, they have to be sown each year.

BARN-YARD GRASS (*Panicum crus-galli* L.).—Although usually regarded as a weed, Barn-yard grass may be made a valuable forage plant. It is a rank grower, and on rich soils will produce a great deal of hay. Being an annual, it must be treated as we do Hungarian grass, which it resembles in many ways.

TIMOTHY (*Phleum pratense* L.).—It is not necessary either to describe or to praise this excellent grass, whose value is conceded by all. That it will grow well in Nebraska needs no argument, and if there remain any doubters they have but to examine the grass collections at the annual State Fairs to have their doubts dissipated. In the eastern counties it is almost universally grown. Fine specimens from Thomas, Custer, Howard, Hitchcock, Furnas, and Box Butte counties attest its capability of growing freely in all parts of the state. It does best upon moist soils, and should not be sown on the uplands. The river valleys are admirably suited to its demands. In these it will endure for a long time, both for hay and pasture.

KENTUCKY BLUE GRASS (*Poa pratensis* L.)—Like the preceeding grass, this one needs no words of praise from me. It merits are admitted. As a grass for pasturage in the fore part of the season, and again in the latter part, it stands unexcelled. Upon all the bottom lands of our river valleys it does well and is rapidly becoming the most important of the pasture grasses in the state. I predict that it will not be many years before we will be ready to hold a "Blue Grass Festival," as was done last year (1889) by the people of southern Iowa. Its universal use as a lawn grass in all our towns and cities is proof of its adaptation to the conditions of soil and climate found in Nebraska.

WIRE GRASS (*Poa compressa* L.).—This resembles under-grown specimens of Kentucky Blue grass, and while it has a forbidding name it is nevertheless a good pasture grass. It will grow well on much drier soil than the preceding species.

MILLET (*Setaria italica* Kunth.).—There are many varieties of this widely grown grass. Those with small simple heads are known as Hungarian grass, while those with the larger and more compound spikes are usually called Millets of some kind. Under cultivation they have taken on many forms. In some the beards are well developed, producing a bristly hairy head, while in others the beards have disappeared, leaving the head smooth.

Few annual grasses have a higher value for Nebraska, especially in the newer portions of the state where permanent meadows have not yet been established. I have seen fine fields of it in all sections of the state ranging in altitude from less than 1,000 feet above sea level to upwards of 4,500 feet.

2. *Weedy Foreign Grasses.*

CHESS OR CHEAT (*Bromus secalinus* L.).—Although not abundant, this weed in wheat fields has already obtained a foothold in Nebraska. In winter wheat regions for a long time it was supposed by some farmers that Chess was a kind of degenerated wheat; of course this was a mistake. Chess is a genuine plant of Nature's own building, and is not a degenerated state of any other.

While we call it a weed, it is nevertheless a nutritious plant, and if cut early enough (before the stem hardens too much) it makes very good hay.

STINK GRASS (*Eragrostis major* Host.).—This is called Candy grass by some people, though for what reason I cannot imagine. It has a peculiar fetid-pungent odor which is sufficiently disagreeable to animals to serve as a perfect protection to it. It is not eaten, and so thrives, and increases rapidly. About buildings, along roads, and paths, and in waste places it is now quite abundant, although originally introduced from the old world.

CRAB GRASS (*Panicum sanguinale* L.).—In lawns and about buildings this is a common pest. I have seen it do much damage to young Clover and Blue grass upon lawns which were not yet well set. Like all the other weedy foreign grasses of this list, Crab grass is an annual and may be eradicated by care in sowing only clean seed and in cutting the grass before any seeds have ripened.

YELLOW FOX-TAIL (*Setaria glauca* Beauv.).—Too common to need extended notice. When cut early it makes a palatable hay. It is quite subject to smut, which annually destroys much of the seed.

GREEN FOX-TAIL (*Setaria viridis* Beauv.).—This is distinguished from the former by its smaller grains and the greener color of the heads. It is even more common than the preceding species. While not affected by the smut which attacks Yellow Fox-tail this species is attacked by a downy mildew, which does it some harm.

IX.—OTHER FORAGE PLANTS.

Observation shows that domestic animals eat more or less of the other vegetation than that belonging to the grasses found in every locality. While they undoubtedly depend more upon the grasses than upon other plants, a few of the latter have, under cultivation, a very high food value, as in the case of the clovers. In the wild state few of the plants not of the grass family have much value for food. Cattle will eat them, it is true, but the per cent of nutritive food in them is small.

A.—*Wild Species.*

Under this head I will mention a few of the most important of the wild plants of this class eaten more or less by domestic animals.

The Sedges look so much like true grasses that they are commonly not distinguished from them by any but botanists. They may be told from grasses by their three-cornered stems. They grow for the most part in wet or moist land, and often constitute a considerable per cent of the "slough hay" cut upon the prairies.

Sedges contain little nutritious matter and are an injury to either hay or pasturage.

The Rushes are of several kinds, and they vary in size from a few inches to several feet in height. While many of them bear some resemblance to the grasses, they possess little nutritious matter. They enter pretty largely into the composition of hay from the lower lands.

Wild Leeks are abundant in some parts of the state, and appear to be eaten readily by cattle in early spring. While they possess some nutritious matter, they are objectionable on account of giving a bad taste to the milk and butter of dairy cows.

Cinque Foil.—There are several native species of Cinque Foil or Five Finger, which are common, and are eaten by animals, along with other forage.

Wild Strawberry.—The leaves of the Wild Strawberry are eaten by cattle, and doubtless constitute a food of some value.

Wild Vetches of several kinds, belonging to the genera *Vicia* and *Lathyrus*, are eaten to some extent. I presume that they have quite a little food value, as they are related to thc Vetch of the Old World (*Vicia sativa*) which has been grown as a foliage plant for ages.

Loco Weeds.—While these are not properly forage plants, unfortunately they are eaten pretty freely by domestic animals, greatly to their hurt. They belong to at least three genera of plants, viz.: *Astragalus*, *Oxytropis*, and *Crotolaria.* Of the first the species which is most known as a Loco weed is *Astragalus mollissimus*, a silky-hairy plant eight to twelve inches in height, and bearing numerous root-leaves, each consisting of from nineteen to twenty-nine leaflets. *Oxytropis lamberti* is much like the preceding. Both are common in most parts of the state. *Crotalaria sagittalis* is found along the Missouri river bottoms, and is less hairy.

I need not stop here to describe the effects of Loco eating. They are too well known to need description.

Wild Clovers of a couple of species occur sparingly in the state. Wherever found they supply a good food for animals.

Wild Sage and other mints are occasionally eaten, probably with profit to the animal.

Blazing Stars of the genus *Liatris* supply an indifferent food to the animals which crop them.

Thistles of several species contain a considerable amount of food which occasionally is used by hungry animals.

B.—*Cultivated Species.*

Popularly nearly all the forage plants not of the proper grass family are still called "grasses." Strictly speaking, none of the following list are grasses. They are "forage plants," and in some cases produce pasture and hay, but nevertheless they are not grasses in the proper meaning of the word.

Nearly all the plants grown on the farm are used more or less as forage by domestic animals. For example I might include pumpkins, potatoes, beets, turnips, apples, and other fruits, besides many others. But I have thought it inadvisable to discuss their merits, confining myself to those whose stems and leaves are eaten either in a green state, or when dried in the form of hay, or preserved as silage. Even with this restriction it is difficult to draw a line which is well marked between those to be included and those not to be.

RED CLOVER (*Trifolium pratense* L.). Of all the forage plants available there is none with more of promise in it for Nebraska than Red Clover. It is already regarded as a necessity upon most farms in the eastern half of the state, and is fast becoming so for the newer, drier, and more elevated western half. No forage plant thus far grown in Nebraska excels Red clover in the quantity and quality of food produced by it per acre. Our soil is peculiarly adapted to its successful growth, and the sooner we give it the widest culture the better it will be for the agriculture of the state.

Red clover has been grown for a long time by our European ancestors, and is more popular now than ever. Dr. Stebler, in his excellent book on "The Best Forage Plants," says: "Red clover has contributed even more to the progress of agriculture than the potato itself, and has had no inconsiderable influence on European civilization. Its cultivation has led to an increased production of stock as food for man, and in this way has fostered and advanced commerce, industry, and science."

Aside from its value as a food for domestic animals, Red clover is one of the most useful crops for ameliorating and enriching the soil. The roots penetrate to a great depth, and in their decay upon subsequent plowing give to the soil a porosity and add nitrogenous elements which are greatly desired by the farmer. For rotative purposes Red clover is one of the very best of plants.

Red clover has become modified into a number of more or less well marked varieties, in fact many authorities consider that we have two distinct species. Dr. Hooker and George Bentham, both eminent English botanists, describe two species. Koch in the Flora of Germany, Hartman in the Scandinavian Flora, Lange in the Danish Flora, and in this country Gray, Wood, Watson, and others admit two species. The two are distinguished as follows in the late edition of Gray's Manual of Botany, p. 128:

1. *Trifolium pratense* L.—"Stems ascending, somewhat hairy; leaflets oval or obovate, often notched at the end and marked on the upper side with a pale spot; stipules broad, bristles pointed; heads ovate, sessile." This is the common, smaller sized Red clover.

2. *Trifolium medium* L.—"Stems zigzag, smoothish; leaflets oblong, entire, and spotless; heads mostly stalked; flowers deeper purple, otherwise too like the last." This is the Mammoth clover, also called the Giant clover.

Whether or not these are sufficiently distinct to be regarded as separate species I will not discuss at present, nor indeed is it particularly necessary that the matter should be decided. By means of the characters given above the farmer may readily tell whether he has the common or the Mammoth clover. The shape of the leaves, the presence or absence of the spot on the leaflets, and the stalked or stalkless heads will distinguish the two kinds.

Red clover is what is called a short-lived perennial, but in ordinary practice its life is little more than two years. Of course much depends upon the treatment it receives as well as upon the soil and climate, and it is perhaps yet too early to pronounce with certainty as to its duration in Nebraska. That it will prove to be more than a mere biennial I now predict with some confidence.

The seeds of Red clover vary much in color, some being yellow, others dark, while still others show a mixture of colors. They are very commonly mixed with various kinds of weed seeds. It has been repeatedly shown that many of the Eastern weeds have come to the West as adulterations of clover seed. On this account, if for no other, it is best for the Nebraska farmer to sow Nebraska-grown seeds. He will not be introducing foreign weeds at any rate.

In sowing clover seed it is better to use larger quantities per acre than is commonly done. According to Stebler there are 279,000 seeds in each pound of good clover seed. One pound would give, when sown, about six plants to each square foot. With six pounds these plants would be two inches apart every way. While with twenty-four pounds there would be one plant on each square inch. Put into tabular form this will appear as follows:

1 lb. per acre = plants about 5 inches apart.
6 " = " 2 "
10 " = " 1½ "
15 " = " 1¼ "
20 " = " 1⅛ "
25 " = " 1 "

Now let a proper allowance be made for poor seeds, which should not be less than one-tenth, while it must often be much more; then make an allowance for poor and uneven sowing, as well as for the inevitable death of many of the young plants, and it will be seen that it is necessary to sow much more than the amounts given above in order to have the plants occupy the ground with a particular closeness. Stebler recommends eighteen pounds per acre as a good average.

The *Dodder* of clover is one of the pests which is to be carefully watched. In Europe it is often very destructive. Stebler says of it in his book, "The Best Forage Plants," written for Switzerland, "Dodder is the enemy most to be dreaded." Thus far it has not appeared in great quantities in this part of the county. It has been reported from Missouri, Iowa, and some of the states to the eastward. I have recently examined one specimen of clover with a dodder upon it, found in southeastern Iowa, but while a dodder it turns out to be not the European pest (*Cuscuta epithymum* Murr.), but a small American species (*C. arvensis* Bey.), which bears much resemblance to it. Whether our American Dodder will eventually become a pest, of course cannot yet be told.

This American Dodder is a small slender vine of a pale yellow color, and having the thickness of an ordinary pin. It attaches itself firmly to the clover stalks by means of short suckers, making it almost impossible to pull it off without breaking. Its flowers are in clusters. They are white in color, and not much bigger than a pin head.

It will be a wise thing for the farmer to cut and burn up every patch of clover infested by this Dodder, first, however, sending me a specimen for examination.

WHITE CLOVER (*Trifolium repens* L.).—For pasturage this clover has valuable qualities which are too often overlooked by the stock grower. The ease with which it may be grown in the West, and especially in Nebraska, ought to commend it to the farmers of this state. Scatter a few seeds upon good soil, even if the wild grass still has possession, and it will not be long before the nutritious stems and leaves will make their appearance.

Stebler, the greatest authority on forage plants, says: "White clover is indispensable for the formation of pastures on low lying lands. It lasts for three or four years, and when the soil is good, even longer. Although the yield is less, it is superior in several respects to Red clover, *e. g.* (1) it thrives on soils of inferior quality; (2) it stands depasturing; (3) liquid manure is more suitable for it; (4) the nutritive value is higher, and (5) stock fed on it are not so liable to swelling (hoven). In pastures, and to a less extent in meadows, it is used for forming 'bottom grass.'" "It occurs wild [in Europe] in all good pastures; if abundant it is a certain indication of good land." "White clover is much less sensitive to climate than Red clover. Although its roots confine themselves mainly to the superficial layers of the soil, still drought is borne very well, because the axial tap-root descends further and absorbs water from the deeper layers."

The seeds are much smaller than in Red clover, there being no less than 740,000 in each pound, so that ten pounds will be ample for thoroughly sowing an acre.

ALSIKE CLOVER (*Trifolium hybridum* L.).—I am not prepared to speak of this clover with that confidence which I wish. I must confess to some doubt as to its great value in the West. I have seen several failures upon the prairies (in Iowa.) Upon the Nebraska Experiment Station in 1888 it did "fairly well." In 1889 the agriculturist reports that "its chief value is the large amount of honey which bees get from it."

ALFALFA (*Medicago sativa* L.).—This plant, also called Lucerne, Chili clover, and French clover, is destined, in my opinion, to become one of the great foliage plants of the central and western parts of Nebraska. That it is suited to our soil has already been well shown, and it only requires time to accustom our farmers to its culture. Under irrigation it produces in Colorado and western Nebraska several heavy crops of good hay. On the Nebraska Experiment Station it promises well.

BOKARA CLOVER (*Melilotus alba* Lam.).—This forage plant is frequently mentioned in agricultural journals, but I doubt its permanent value for the grower of stock. It is a well known and valuable honey-producing plant.

VETCHES OR TARES (*Vicia sativa* L.); COW PEAS (*Dolichos chinensis* L.); JAPAN CLOVER (*Lespedeza striata* H. & A.); KIDNEY VETCHES (*Anthyllis vulneraria* L.); SERRADELLA (*Ornithopus sativa*); SANFOIN (*Onobrychis sativa* L.), and LUPINES of various sorts (*Lupinus* sp.) are forage plants of considerable value in various countries, and it is likely that after enough experiments have been made some of them will be found to be useful in Nebraska. At present no one is warranted in purchasing heavily of the seeds of any of the foregoing with a view to their successful cultivation upon the plains. They may be successful, but if so the fact has not yet been demonstrated.

X.—FOOD VALUES OF GRASSES AND FORAGE PLANTS.

Roughly speaking the food value of a grass depends upon the per cent of the albuminoids as shown by chemical analysis. The following table, compiled mainly from one made by Clifford Richardson, will serve as a general guide to the stock grower. The analyses were made upon the hay at ordinary stage of dryness:

	Albuminoids.	Fat.	Non-Nitrogenous extract.	Fibre.	Ash.	Water.
Red Top (*Agrostis alba* var. *vulgaris*)	9	3	48	20	6	14
Johnson grass (*Andropogon Sorghum* var. *halepensis*)	10	2	45	22	7	14
Tall Oat-grass (*Arrhenatherum avenaceum*)	10	2	43	24	7	14
Orchard grass (*Dactylis glomerata*)	8	3	47	21	7	14
Randall grass (*Festuca elatior*)	12	4	44	19	7	14
Rye grass (*Lolium multiflorum*)	10	3	48	17	8	14
Barn-yard grass (*Panicum crus-galli*)	7	2	43	24	10	14
Timothy (*Phleum pratense*)	7	3	48	24	4	14
Kentucky Blue grass (*Poa pratensis*)	10	3	46	21	6	14
Wire grass (*Poa compressa*)	9	3	49	19	6	14
Millet (*Setaria italica*)	8	2	48	21	7	14
Red clover (*Trifolium pratense*)	13	2	39	27	5	14
White clover (*Trifolium repens*)	15	4	35	26	6	14
Alfalfa (*Medicago sativa*)	15	3	28	34	6	14

XI.—SOME GENERAL REMARKS ON CULTIVATION.

Some of the grasses and forage plants mentioned in the preceding pages require that the soil of the prairie should be thoroughly pulverized and mellowed before the seed is sown. This mellowness must extend deep enough so that the roots can readily penetrate to a good depth, and also, that the bottom moisture of the soil can readily find its way to the surface. The prairie soil before breaking the sod is very compact, and it requires several years of culture to mellow it sufficiently to serve as a good seed bed for many forage plants. It is generally much better to cultivate the ground for a couple of years, using such a crop as corn, then follow with Hungarian grass or Millet. By this time it ought to be ready for Red clover. If, however, such a crop as potatoes could be grown on the land it would mellow it still deeper. Buckwheat is a great mellower of the soil, too. What is necessary is that there should be a mellow condition of the soil to a great depth. It ought to be mellow "*all the way down.*"

Now with the ground in good condition, the Red clover may be sowed with oats, wheat, barley, rye, or any other crop which will serve to shade the young plants. The crop must not be sown too thickly, lest the clover be choked out. Some people (especially in the older parts of the state) depend upon the weeds for the necessary shade, and do not sow anything with the clover. Timothy, Orchard grass, and Alfalfa generally require the same treatment as Red clover.

There are other forage plants which appear to do much better upon firm soils than upon those which have been made mellow. This is eminently the case with Kentucky Blue grass, and to a less degree with White clover. For these, and especially the former, it is desirable to firm the soil as much as possible in order that the young plants may find the conditions in which they grow best. This may be done by the use of a heavy roller, or by the tramping of stock.

In an instructive account of the method adopted by some Kentuckians to secure a good stand of Blue grass, Dr. Killebrew states in his book, "Grasses, Meadows, and Pastures," that the best plan is to sow with rye, wheat, or barley. After sowing grain, the land is to be harrowed, and, if possible, rolled. Then the grass seed is sown and brushed lightly, after which all the cattle, horses, and sheep which can be obtained are turned into the field to tread it down and make the soil compact. They are kept on the field until the soil is well packed. This treatment prevents the grass from drying up in the summer heats and droughts.

The practice is, then, not to allow stock upon the young pasture for a year, after which it will be so firmly established that it is likely to endure many years of reasonable pasturage.

In this state many men have had success in starting Blue grass pastures by going upon the unbroken prairie, and, after feeding down the wild grasses quite severely so as to weaken them, with a heavy harrow or cultivator scarifying the surface so as to offer places for the seeds to start. The seed is then sown upon the ground, or in some cases before the scarifying operation. Sometimes the farmer scatters over the surface the waste at the bottom of his mow of Blue grass hay, or the manure from animals fed on such hay. When properly done in a favorable year the success of this method is unquestioned. Much the same method may be used for White clover.

XII.—SEED TABLE.

In the following table I have given the legal weight of a bushel of good seed where it has been possible to find it, and the number of pounds of seed per acre recommended by Dr. Stebler. As to the latter it must be borne in mind that much depends upon the purity and germinating power of the seed. It rarely happens that more than 75 per cent of the seeds as bought of the dealers will grow. In the table allowance has been made for the average per cent of germination:

	Pounds in a bushel.*	Pounds of average seed to be sown per acre.
Red Top (*Agrostis alba* var. *vulgaris*)	8 to 32	9¾
Orchard grass (*Dactylis glomerata*)	12 to 16	35
Randall grass (*Festuca elatior*)	12 to 26	52
Timothy (*Phleum pratense*)	45	16
Kentucky Blue grass (*Poa pratensis*)	14	17½
Red clover (*Trifolium pratense*)	60	18
White clover (*Trifolium repens*)	60	10
Alfalfa (*Medicago sativa*)	61 to 63	25

*These weights vary with the cleanliness of the seed. Where much chaff adheres to the seed the weight is less. The figures given for Timothy, Blue grass, and clover are official for Nebraska, the others are on the authority of Stebler, for Europe.

XIII.—FORAGE PLANTS UNDER IRRIGATION.

Three years ago I spoke as follows in my report: "I venture the assertion that ultimately a considerable portion of the area of cultivated soil in our western counties will be provided with facilities for irrigation. The rapid descent of the rivers, as they run down the great slope, is such that the construction of irrigating canals is rendered comparatively easy. Should this be accomplished, it would render possible the growth of forage crops such as we have never so much as dreamed of for amount. Red clover, Alfalfa, Timothy, and Blue grass and many others, now grown on the irrigated lands of Colorado, might then be grown in enormous quantities, two or three crops a year growing upon each field with but little trouble." Since then we have had a bulletin by Professor Hicks on "Irrigation in Nebraska," published by the Agricultural Experiment Station, in which it is shown that irrigation is possible along many of the streams of the state. Already the matter has taken shape, and we hear of irrigation companies in many parts of the state.

Allow me to repeat in this connection what I said three years ago, and to add that what I then said is doubly true now.

"For the successful prosecution of this work of the future we need to guard jealously the great mountain forests in Colorado and Wyoming, from which our rivers derive their supply of water. These Nebraska rivers are fed upon the snows which annually fall in heavy masses upon the Rocky mountains. If these mountains are covered with forests, the snows melt slowly, and so gradually give out their precious water to the streams as they flow over the great plains, giving to the soil a fertility like that of ancient Egypt. But if we allow the forests of the mountains to disappear, the snows will quickly melt before the early summer's suns, and by midsummer there will be only the sandy beds of the former great rivers of the plain.

"Gentlemen of this society, we cannot afford to sit still while this destruction of our wealth-giving rivers is going on. Every year thousands of acres of the mountain forests of Colorado and Wyoming are destroyed, and year by year our midsummer rivers are dwindling away. We owe it to ourselves, to our children, to our good state, to see that this heritage is not taken from us."

XIV.—SOME DISEASES OF GRASSES.

In this brief preliminary note on this subject I will refer only to the diseases due to the attacks of parasitic fungi. From a hasty examination of the Catologue of Nebraska Plants prepared by Mr. Webber it appears that the grasses have about forty different kinds of fungi which injure them. Fortunately not all occur on any one grass, but in some cases two, three, four, or even more, attack a single kind of grass.

The Rusts attacking grasses number no less than fifteen species. When abundant they do a great deal of harm by reducing the growth of leaf and stem. In looking at the wild grasses in order to judge of their merits with a view to cultivating them, it will be well to notice whether or not they are much infested with rusts.

So far as I know, the rusts are not in themselves harmful to the animals which eat rusted grass or hay.

The Smuts.—Of these about seventeen species attack various kinds of grasses. All are very harmful to the infested plants, particularly so as they most frequently destroy the flowers or seeds.

Whether they injuriously affect the animals which eat them has not yet been fully decided.

The Mildews.—A "Powdery Mildew" is quite common on many grasses, especially when they are closely grown and in damp weather. Cattle do not relish such mildewed grass. A "Downy Mildew" is known to occur on one of the Fox-tail grasses, and I am told that it has been seen on Millet also. It turns the leaves yellow, and ultimately kills them.

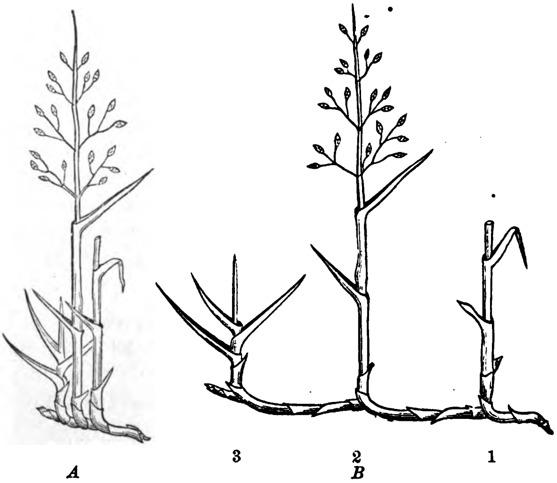
Leaf Spot.—Several kinds of fungi bearing this name are very common on our grasses, and all do more or less harm. Without taking time now for a particular description, it may be said that all show themselves as spots upon the leaves and stems. In some species these spots are pale or white, while in others they are reddish, brownish, or even black. As the fungi causing these diseases are internal, nothing can be accomplished in the way of remedy by any external application or poisonous solutions. Should any patch of grass show much leaf-spotting, it may be well to thoroughly burn it over.

Ergot.— Some of the grasses are quite commonly affected by Ergot, rendering them more or less dangerous to domestic animals. It appears as a black, spur-like growth in place of the grain. It is common on rye, especially upon stray stalks growing at a distance from other rye plants. It occurs in abundance upon Wild Wheat grass and Wild Rye. I once saw it in Ohio very badly affecting the heads of Blue grass. In Iowa I have seen it on Timothy.

Care should be taken not to make hay of any grass which happens to have much Ergot upon it, as it is known to produce abortion in pregnant animals. When abundant it produces a dangerous gangrene in cattle, sometimes causing them to slough off the lower joints of their feet.

XV.— ON THE PRACTICAL STUDY OF GRASSES.

In the following paragraphs I propose to give, in as non-technical language as possible, the principal points in the structure of grasses which are necessary to be known in order to distinguish the more difficult species having agricultural interest.



Diagrammatic figures of a perennial grass, showing the horizontal underground stem sending up shoots each season. In *A* this underground stem is short, while in *B* it is elongated. 1, is the last year's shoot; 2, the shoot of the present year, and 3, the young shoot of next year.

It is well to look over the plant in the order given below, noting carefully the different points.

1. *The Underground Part.*— Let it be remembered that not every underground part is root. Many grasses have stems as well as roots under the ground.

The roots of grasses are usually fibrous, and grow from the base of the stem forming a dense cluster, as in Fox-tail and wheat, or they grow out from the sides of horizontal underground stems, where they may be scattering and few, or abundant and densely matted.

The underground stems are distinguished from roots by the fact that they are scaly. No root is ever scaly. These underground stems creep through the ground and send up stems to the surface at intervals, as shown in Figs. A and B. Kentucky Blue grass shows good examples of underground stems. A grass possessing underground stems is perennial, and if hardy, will usually make a dense sod, and endure close pasturage.

2. *The Stems.*— Grass stems are always jointed. In general they are round or roundish, and they are never triangular, by which fact they may be distinguished from the sedges, whose stems are *triangular.* The joints are enlargements of the stem at the places from which leaves grow; they are solid, having no hollow in the center, and they retain for a long time the power of bending, by which means a stem when bent over is able to right itself again.

The stem between the joints is usually hollow, as in Timothy, Kentucky Blue grass, wheat, oats, etc., but in the Blue Joints (*Andropogon*), Indian corn, cane, etc., it is solid. This character is one to be carefully noted in any examination, These structures are shown in the plate (Figs. 1, 2, 3, 4.)

3. *The Leaves.*— Grass leaves are always arranged in two opposite rows on the stem. Thus if one leaf is on the north side of the stem, the next one above will be on the south side, the next again on the north, and so on, as in Figs. A and B, p. 28. Now let it be remembered that in sedges (which resemble grasses very closely) the leaves are in *three rows* instead of two.

Every grass leaf consists of two parts, the lower which surrounds the stem like a sheath (and so called the "sheath"), and the upper which grows away from the stem, and called the "blade." On close examination the sheath is seen to be split down from the point opposite to the blade to the joint of the stem. (See plate, Figs. 1, 2, 3, and 5).

The "blade" is more or less flat, and pointed. In many cases the upper surface is "channeled," *i. e.* trough-shaped. The ribs, which run from end to end, usually show very plainly, especially the middle one, called the "mid-rib." The tip or end of the blade may come to a plain point, or it may be shaped like the bow of a boat, when it is said to be "keeled." We also say of the whole blade that it is keeled when the mid-rib projects as a sharp ridge from the under surface.

At the point where blade and sheath unite there is usually a projecting tongue called the "ligule." It must be closely looked at, and its structure clearly made out, as in some cases it is of much importance in distinguishing kinds from one another. (See plate, Fig. 2.)

4. *The Flower Head.*— It is always important to notice the general shape of the flower head. The two principal forms are the "spike," as in timothy, wheat, bar-

ley, etc., and the "panicle," as in oats, Kentucky Blue grass, the tassel of corn, the head of sugar cane, Johnson grass, etc. (Figs. A and B). In the "spike" the flowers are clustered into a more or less close cylinder, while in the "panicle" they are scattered irregularly upon spreading branches.

5. *The Flowers.*—A grass flower is a small thing and often one has to use a microscope to make out all its parts. Instead of having pretty colored leaves, as in garden flowers, the flowers of grasses have chaff only; but if we look carefully at the chaff we will find that there are many interesting differences. Thus in some the chaff may be blunt, in others pointed, and in others again prolonged into a beard of greater or less length. Moreover, in the same grass there are differences in the chaff which may be made out.

The grain or seed is enclosed in the chaff more or less loosely. In wheat the grain easily separates from all the chaff, as it does also in rye and corn. In most cases some of the chaff adheres to the grain, as in oats, barley, Kentucky Blue grass, Orchard grass, Red Top, etc. In examining the grain it is necessary to note carefully the shape and the surface characters. Some grains are smooth, while others are rough, or in some cases hairy.

As many of the foregoing points as possible should be noted in the examination of any unknown grass, whose name and qualities are desired.

In sending a specimen of a grass for examination it is always well to get a complete plant, which will include the underground part, the stem, the leaves, and the flower head with seed.

For the beginning of the examination of grasses get the most excellent pamphlet called "The Agricultural Grasses and Forage Plants of the United States," by Dr. George Vasey, and published by the Department of Agriculture, Washington, D. C. It can be had free on application to the department.

Then get "The Best Forage Plants," by Dr. F. G. Stebler and Dr. C. Schroeter. It may be bought of any good bookseller for about $2.50 to $3.00. Both these works are fully illustrated, and the second is especially valuable in practical suggestions.

For other books I will refer the reader to my list published in last year's report, pp. 139 and 140.

Let it be remembered that we are growing and experimenting with a good many wild grasses, in addition to the "tame" species, upon the Agricultural Experiment Station, and that information regarding many of these may be obtained upon request. I will be glad to examine any specimens sent, and give such information as to probable value, habits, etc., as is possible. In sending, please observe the following directions:

1. Collect good specimens, including roots, stems, leaves, and flowering or fruiting heads.
2. In case you send more than one kind, attach a tag to each sample.
3. Number your samples from one (1) upwards, and put your name also on the tag.
4. Wrap the samples one by one, in a newspaper, and send to me by mail.
5. On packages so prepared, and containing no other writing, the postage is ONE CENT FOR EACH OUNCE.

6. Send a postal card with your package to let me know to whom to make reply, and giving any items which may be of value.

If you retain *duplicate samples*, similarly numbered, I can reply by referring to the numbers alone.

EXPLANATION OF THE PLATE.

Structure of leaf and stem of Big Blue Stem (*Andropogon provincialis*):

Fig. 1. Portion of the stem and leaf. At *a* is a joint or "node"; from *a* to *b* is the sheath of the leaf; above *b* the base only of the leaf is shown.

Fig. 2. Part of the stem and leaf split open; the half stem lies in the leaf sheath *d;* at *c* is shown a little tongue, or "ligule," at the point where sheath and blade unite.

Fig. 3. Part of stem and joint split open; at *f* is the joint and at *e* the sheath.

Fig. 4. An end view of a stem cut squarely across, showing it to be solid; that is, not hollow. The little dots are the woody strings which run lengthwise through the stem.

Fig. 5. An end view of the sheath cut squarely across, showing how its edges lap over one another.

Fig. 6. An end view of a leaf cut squarely across, showing the channel or furrow running through the middle.

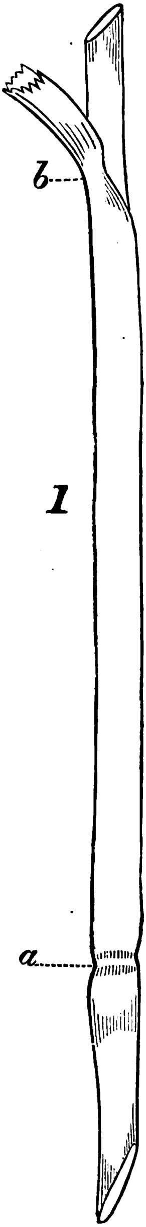
Fig. 7. An enlarged view of Fig. 6, showing the positions of the veins, which appear like small round figures in the drawing (enlarged six times).

Fig. 8. The center of Fig. 7, enlarged to thirty-six times its natural size, showing at *g*, *g* the cut ends of the veins. Smaller veins lie between these, as shown in the figure. At *h* is shown a layer of tough fibres, and at *i* the soft tissue in the center of the leaf.

Fig. 9. An end view of leaf vein (*g*, at left hand of Fig. 8) enlarged 200 times the natural size. At *j* is the mass of tough fibres of the upper surface of the leaf, and at *k* that of the lower surface. The vein is largely composed of these tough fibres, which are drawn with circular outlines with a dot in the center.

Fig. 10. A small piece of the skin (epidermis) of the lower surface of the leaf showing the oblong cells with wavy walls, and at *l* two rows of breathing pores (stomata). This figure is magnified 250 times the natural size.

Fig. 11. End views of two dry leaves, cut squarely across, showing how they roll backwards, so that the under surface is protected. Slightly enlarged.



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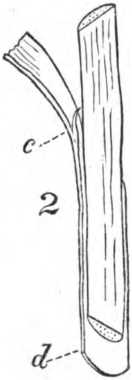

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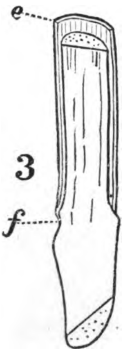

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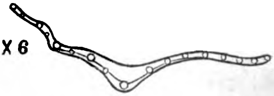

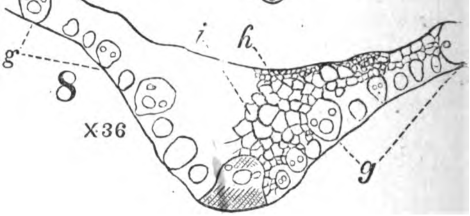

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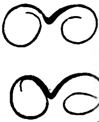

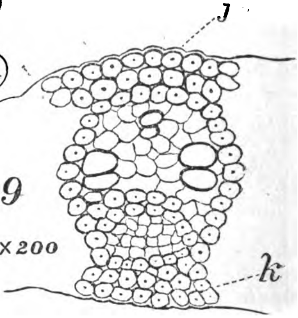

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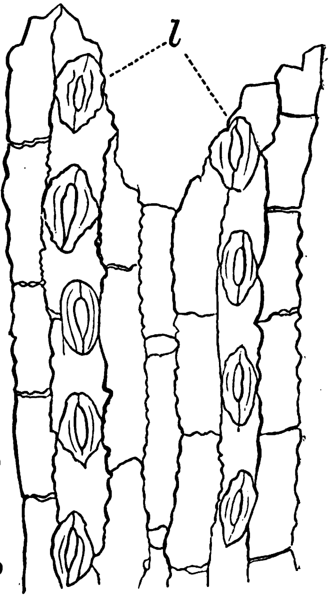

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XVI.—THE NEBRASKA FLORA.

In the Botanical Department of the University we have been at work for many years endeavoring to make a complete list of the plants of the state. Year by year the materials at command have increased, and it is now possible to publish a reasonably complete catalogue. I take pleasure in transmitting the "Catalogue of the Flora of Nebraska," prepared by Mr. Herbert J. Webber, my assistant in botany, and recommend that you print it as an appendix to this report. It is a most valuable work, both for the facts it contains as to the distribution of the grasses, forage plants, trees, shrubs and other higher forms, but also for the fungi and other lower plants, many of which are of direct economic interest to mankind.

CATALOGUE OF THE FLORA OF NEBRASKA.

PROTOPHYTA—ANTHOPHYTA.

By HERBERT J. WEBBER, M. A.

A CATALOGUE OF THE FLORA OF NEBRASKA.

INTRODUCTION.

For some time Nebraska botanists have felt the need of a catalogue of the flora of the state, so far as known. It is to supply this want, and to render possible the publication, at some future time, of an approximately complete list, that this catalogue is prepared.

Nebraska, in position, is especially interesting, being about the geographical center of the United States. One crossing the plains a few years ago would not have predicted the present luxuriance and present possibilities. With the advent of civilized man, climatic conditions are changing. Moister air brings more luxuriant and varied vegetation. Since the checking of prairie fires, natural groves are springing up along the streams, followed by the appearance of many forest plants. Especially is this noticeable along the eastern borders. The eastern and valley flora, so long separated from the western by the Missouri river and "Great Desert," is rapidly spreading over. So rapid is this change that one can almost see an advance from year to year.

From east to west the elevation gradually increases until in the extreme western part of the state it reaches an altitude of from 4,000 to 5,000 feet, and in one place, "Scott's Bluff," Cheyenne county, is said to reach the height of fully 6,000 feet. In all this high western portion, including about two rows of counties, running north and south, we find the characteristic mountain flora. The southeastern portion of the state, Richardson county, has an elevation of only about 800 feet.

Between the two advancing floras a portion of the native flora of the "Great Desert" remains, and before cultivation has advanced to such an extent as to overcome this, it is desirable that it be thoroughly studied and recorded.

Many things, once common, are gradually disappearing. The Buffalo grass (*Buchloe dactyloides*), once the prevailing plant, is, in eastern Nebraska, found only in small patches, and is fast becoming rare. The wild pumpkin (*Cucurbita fœtidissima* H. B. K.), said, formerly, to have occurred in the eastern part of the state Brownville (?), is now limited to the west and is there rare.

The now prairie state was, perhaps, at one time wholly wooded, or much more so than at present, and the forest extension downward from the Rocky mountains may possibly have connected with the eastern forest region. This supposition is based chiefly on the distribution of the yellow pine (*Pinus ponderosa* Dougl. var. *scopulorum* Eng.) in Nebraska, and is, possibly, somewhat premature. The facts, however, surely lead one to suspect this.*

The yellow pine of the western forests extends in a narrow strip on what is called "Pine ridge" (which enters the state from Wyoming in extreme northwestern

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* Prof. Aughey, in his Physical Geography of Nebraska, has made the same deduction from a geological standpoint.

Nebraska, in Sioux county), eastward, following the trend of the Niobrara river to Keya Paha and Rock counties, a distance of 250 miles. It is found, also, in widely-separated localities in the central part of the state.

In Custer county it occurs in but a single deep canon ("Pine canon," crossing the 100th meridian), so far as known, but in such quantity that a saw mill was set up in the canon. Pine trees occur also in a few canons on the Loup river, in northern Vallley county, and are reported as occurring in isolated canons in Greeley county. The three latter localities are separated from each other by nearly forty miles, and are nearly a hundred miles south of the Pine ridge region. Decaying pine stumps and scattered trunks are said to occur in various places on the central and western plains.

These isolated groups and straggling remains seem to indicate that all of treeless, barren, central and western Nebraska was once one forest, stretching over the sand hill region from Custer county northward to Long Pine, and thence westward to the Rocky mountains.

Many theories have been advanced to explain the treeless prairie region of the central United States. The one, perhaps, most commonly accepted is the scantiness of the rainfall. Professor Whitney thinks "that the extreme fineness and depth of the usual prairie soil will account for the absence of trees." Dr. Asa Gray concludes that the *eastern* portion of this now woodless plain may not always have been woodless, but says nothing as to the possible connection of the eastern with the western forests, and leaves the reader with the impression that he looks upon them as never having been connected, although believing that they do not occupy at present the position that they originally did. Speaking especially of the border between the central prairie and eastern forest regions, Dr. Gray says:

"I am disposed, on general considerations, to think that the line of demarkation between our woods and our plains is not where it was drawn by nature. Here, when no physical barrier is interposed between the ground that receives rain enough for forests, and that which receives too little, there must be a debatable border, where comparatively slight causes will turn the scale either way. Differences in soil and difference in exposure will here tell decisively. And along this border, annual burnings, for the purpose of increasing and improving buffalo feed, practiced for hundreds of years by our nomad predecessors, may have had a very marked effect. I suspect that the irregular border line may have in this way been rendered more irregular, and have been carried further eastward wherever nature of soil or circumstances of exposure predisposed to it." (Forest Geography and Archæology, by Asa Gray, Am. Jour. Sc. and Arts, vol. XVI; 1878.)

Prof. Sargent, although affirming that it is merely a surmise, without, at present, circumstantial evidence, strongly asserts his belief that the eastern border of this treeless region at one time extended much further westward. He gives the possible limit as about the 95th meridian, in western Iowa, but does not seem to consider it possible that it may have extended into, and possibly through, Nebraska to the Rocky mountains.

We now know from actual tests, many times repeated in all portions of Nebraska, that trees will grow and grow well. Eastward as far as the 100th meridian, in the very heart of the plain region, we now have circumstantial evidence convincing in character that trees have at some time covered an extended area.

As to the possible destruction of this supposed forest, if it ever existed, we can only very unsatisfactorily surmise. The annual burning by Indians, suggested by Dr. Gray as possibly having influenced the present eastern line between forest and prairie, may possibly be considered as having also materially influenced our western separating line. Several observations seem to give this theory considerable prominence.

Until very recently (twenty years ago perhaps) the annual burnings, extending as far eastward as the Missouri river, destroyed whatever trees or shrubs took root in exposed positions, thus hindering the growth of forests and introduction of forest plants as above referred to. Since the checking of these prairie fires, forests are springing up as if by magic, and every stream is fast becoming lined. Not satisfied with this, the bur oak and green ash, "pushing in their desires," are spreading out and in places taking possession of untilled upland. It seems that at no distans day, were this spreading not limited by cultivation, Nebraska would again be, at we surmise it has once been, a *forest*. Professor Sargent's distribution maps already need correction.

In some cases, as in the Pine canon of Custer county, so prominently mentioned above, Cedar canon of the same county, and other isolated canons of the state where large trees occur, it devolves upon us to explain their escape from these annual fires. In all cases that have come under my observation this, I think, may be very plausibly done. Places will undoubtedly be found that cannot be so explained, but these instances illustrate a significant tendency.

Cedar canon, near New Helena, Custer county, Nebraska, contains large trees of red cedar, hackberry, box-elder, ash, elm, cherry, and plum. Ash and box-elder trees reach to nearly one and one half feet in diameter. The red cedars grow chiefly on the sides of the bluffs and frequently reach quite a large size. A section of a trunk in the University cabinet from this canon measures about two feet in diameter and is something over 150 years old. The canon is about one and one half miles or more long, extending in a northwesterly direction. The sides are precipitous and from 100 to 200 feet high. Scrubby bushes of the hardy shrub, *Shepherdia argentea*, line the edges of the bluffs. Occasionally red cedars occur just over the edge above, in which case they are usually charred and dead, probably killed by the effects of the fires. The canon, where it ends, does not run out gradually, but drops down abruptly. This fact, connected with the direction of the canon northwest to southeast, the very steep sides (in almost all places), and the appearance of the outer trees, leads me to conclude that this and perhaps the other few isolated wooded canons are among the fortunate ones which, by their physical formation, are protected from the ravages of the fires which rage without. It will be remembered that these prairie fires most frequently run in a southeasterly direction.

By very careful inquiry I learn that Pine canon, with its interesting contents, possesses relatively the same characteristics.

Similar instances of the probable disappearance of forests occur elsewhere. Professor Rothrock describes one in South Park, Colorado: "From some facts observed I am led to think that at no distant past the growth of *Coniferæ* extended much lower in the park than it now does. I have seen the decaying remains almost down to the Platte. * * An occasional isolated clump of these trees still survives, far removed from their associates on the mountain side; and at times one may observe that the prolongations of pine woods, which extend out into the park, become less and less dense, until finally only a single tree remains at intervals, these disappearing, and then only the half decayed remains reach further out toward the valley. In one place it was observed that the tops of these dead trees all pointed to the east. This suggested the idea that the destruction may have been due to one of the fierce west winds which, during the fall months, are so prevalent in South Park. Once destroyed, other vegetation might readily crowd the young trees out. A notable example of this was seen in one portion of the foothills, where a whole forest of *Pinus edulis* lay prostrate, with not a single young tree coming on." Winds may have aided the recession of the pine forests in Nebraska, but could not be considered, I think, as of much consequence here.

Other similar changes might be mentioned, but suffice it to say, that at the present time, with the peculiar intermingling of eastern, western and central floras, Nebraska is, to the botanist, an interesting place.

Among the particular points of interest may be mentioned the "Salt basin" at Lincoln, and the large surrounding saline region, bringing within our scope many forms almost exclusively marine. Especially is this true of the algal flora (as, *Biddulphia lævis* Ehr., *Amphiprora pulchra* Bail., *Conferva inæqualis* Rabenh., *Enteromorpha compressa* (L.) Grev.).

Dr. Bessey, in his report on grasses, as botanist of the State Agricultural Society, divided the state into six botanical regions, the divisions being based on physical characteristics, chiefly that of elevation. Whether characteristic differences in their flora may be recognized remains to be seen. It is certain, however, that a natural division into eastern or Missouri river valley region, central or sand hill region, and western or mountain region above indicated may be made. In the distribution of her flora, Nebraska is *continental.* The eastern region has a flora noticeably eastern in character. The central or sand hill region still preserves the characteristic representatives of the "Great Plains." This region might properly be divided into a northern and a southern region by the Platte river. The portion south of the Platte can hardly be classed as sand hills. The western region has the characteristic usually low, wooly, scapose plants of the mountain flora

In regard to nomenclature I may claim nothing original, except perhaps in a few particular species. I have endeavored in all cases to accept the latest and best authenticated names. The general system is, with a few exceptions, that adopted by Dr. C. E. Bessey in his Botany. In internal arrangement of families and genera various authors are followed. In the *Anthophyta* I have followed the system of Dr. Chr. Luerssen, of the University of Leipzig (Handbuch der Systematischen Botanik, II. Band) in the arrangement of families, believing it to be the most natural of any yet proposed, and wishing to bring it before our students more prominently for consideration. The synonymy here is based chiefly on "Coulter's Manual" and the "Catalogue of Anthophyta and Pteridophyta reported as growing spontaneously within a hundred miles of New York City." As to the other branches, I follow in general, in the *Musci*, Lesquereux and James; in *Hepaticæ*, Underwood's "North American Hepaticæ;" in *Fungi*, Saccardo's "Sylloge Fungorum;" in *Algæ*, Wolle's "Fresh Water Algæ of the United States," and De Toni's "Sylloge Algarum."

Among the parasitic fungi, new hosts are in many cases added to our already large list. Three specimens of rusts, from their difference from known related species, are considered as new varieties; several changes are made here also as to the identity of species and connection of stages, justified, I think, by the facts discovered.

In the preparation of this list many friends have aided me. I cannot too heartily and sincerely express my thanks to Dr. C. E. Bessey, my instructor, for aid in numerous ways, and for the use of his collections and the herbarium of the University of Nebraska. The valuable addition of Long Pine and Fort Robinson specimens are chiefly of his collecting. To Messrs. T. A. Williams, of Weeping Water, Roscoe Pound and J. G. Smith, of Lincoln, I am indebted for much aid and many additions to my herbarium. Mr. Williams furnished the greater part of the information in regard to Weeping Water plants. The list of lichens is entirely his work. Mr. Pound aided greatly in the fungi, principally the imperfect forms, furnishing many new things. The list of yeast plants and Mucoraceæ are entirely his work. I also received much aid from him in the Anthophytes.

Mr. Smith gave the use of his herbarium and furnished information in regard to various plants.

For my list of Antelope county specimens I am indebted to Miss E. R. McGee, of Farley, Iowa, who has kindly furnished me specimens.

From the herbarium of the State Normal School at Peru, through the kindness of Mr. Taylor, I obtained localites for 250 flowering plants, and fifty additions to my herbarium.

For aid in the identification of species, thanks are due to Drs. N. L. Britton, J. M. Coulter, L. M. Underwood, George Vasey, Charles R. Barnes, and George Rex; Professor L. H. Bailey, Mr. J. B. Ellis, Mr. Charles H. Peck, Rev. Francis Wolle, and Mr. A. P. Morgan.

To the many others who have aided me in this work thanks are cordially tendered.

The only similar publication preceding this is "The Catalogue of the Flora of Nebraska," by Professor Samuel Aughey, issued in 1875, including Anthophyta, Pteridophyta, Bryophyta, and a few other algæ and lichens. The length of time intervening justifies a second catalogue, even if we overlook the fact that the first was based, or appears to have been based, chiefly on range and distribution as given by authors, instead of specimens actually collected within the limits of the state and preserved for reference.

The present catalogue is based on specimens in actual existence and subject to correction if necessary. I have under almost every species refered to the herbarium where a specimen may be found, the reference being by letter as follows:

B.—In herb. C. E. Bessey. P.—In herb. Roscoe Pound. W.—In herb. T. A. Williams. S.—In herb. J. G. Smith. U.—In herb. University of Nebraska.

Specimens that are not followed by one of the above letters are to be considered as preserved in my own herbarium.

A few specimens, chiefly among the algæ, where found in many small quantities, have not been preserved.

"Coulter's Manual" and the new edition of "Gray's Manual" definitely mention a few plants as occurring in Nebraska that I have not found. These I insert, in every case stating under the particular species on what authority it is admitted. I very much doubt the occurrence of a few species thus entered and indicate this doubt by ?, following the specific name.

In every case a locality is cited and in may cases several. Those cited from

Lincoln, Hastings, Wymore, Brownville, Tecumseh, Nebraska City, Milford, Broken Bow, Anselmo, Alliance, Belmont, Crawford, Harrison, Hat Creek basin, Sioux county, Dismal river, Thomas county; and Thedford are chiefly of my own collecting, as are also many from Weeping Water and Peru. The other localities are from collectors as indicated above, or in the catalogue.

Introduced and escaped species, when known to be such, are printed in SMALL CAPITALS.

This catalogue contains 1,890 species and varieties; of which 39 are Protophyta, 95 Zygophyta, 20 Oophyta, 691 Carpophyta, 47 Bryophyta, 17 Pteridophyta, and 981 Anthophyta.

It is hoped that the publication of this catalogue may lead to further additions to the knowledge of our flora, and to the awakening of a more general interest in the subject.

It is intended to publish supplements to this list from year to year, including additions and corrections. It is earnestly requested that botansts and others interested send notes and specimens of plants not named in the catalogue, or from new localities, in order that they may be studied and systematically recorded. All such communications should be addressed to the Botanical Department of the State University of Nebraska, Lincoln, Nebraska.

BOTANICAL LABORATORY, UNIVERSITY OF NEBRASKA, June 1, 1890.

PROTOPHYTA.

CLASS I.—MYXOMYCETES.* THE SLIME MOULDS.

1. PLASMODIOPHOREÆ.

1. PHYTOMYXA Schroet.
    1. *Phytomyxa leguminosarum* (Frank.) Schroet. (*Schinzia leguminosarum* Frank.) Clover tubercle. On white clover (*Trifolium repens*). Lincoln. Very common; forming small clavate tubercles on the roots. Apparently not injurious.

2. TRICHIACEÆ.

2. HEMIARCYRIA Rost.
    2. *Hemiarcyria clavata* (Pers.) Rost. On old wood. Lincoln; Peru.
    3. *Hemiarcyria rubiformis* (Pers.) Rost. On decaying logs. Lincoln.

3. ARCYRIACEÆ.

3. LYCOGALA Mich.
    4. *Lycogala epidendrum* Buxb. On old logs. Lincoln; Crete.
    5. *Lycogala flavo-fuscom* (Ehrenb.) Rost. On decaying stumps. Lincoln.
4. ARCYRIA Hall.
    6. *Arcyria cinerea* (Bull.) Shum. On old wood. Lincoln.
    7. *Arcyria pomiformis* (Roth.) Rost. On decaying wood. Lincoln.

4. CRIBRARIACEÆ.

5. DICTYDIUM Schrad.
    8. *Dictydium cernuum* (Pers.) Nees. On old logs. Lincoln. U.

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*Late authorities place the *Myxomycetes*, or *Mycetozoa* as now called, in closer relation to the animal than the vegetable kingdom. I admit them to this list, because they are so generally studied by botanists.

5. LICEACEÆ.

6. LINDBLADIA Fries.

9. *Lindbladia effusa* (Ehr.) Rost. On old stumps. Lincoln.

6. STEMONITACEÆ.

7. STEMONITIS Gled.

10. *Stemonitis dictyosporia* Rost. On stumps, etc. Lincoln. Dr. Rex believes this to be as common as *S. Fusca*, although, so far as known, it has not been before recorded from this country.

11. *Stemonitis morgani* Pk. On decaying logs. Lincoln.

7. SPUMARIACEÆ.

8. SPUMARIA Pers.

12. *Spumaria alba* (Bull.) DC. On stems of weeds, very common. Lincoln; York.

9. DIACHÆA Fries.

13. *Diachæa leucopoda* (Bull.) Rost. On leaves, common. Lincoln.

8. DIDYMIACEÆ.

10. DIDYMIUM Schrad.

14. *Didymium farinaceum* Schrad. On old wood. Lincoln.

15. *Didymium microcarpum* (Fr.) Rost. (*D. xanthopus* Ditm. On ground and old decaying stems. Lincoln.

11. CHONDRIODERMA Rost.

16. *Chondrioderma floriforme* (Bull.) Rost. On old stems. Lincoln; Peru.

17. *Chondrioderma globosum* (Pers.) Rost. On decaying leaves. Lincoln.

9. PHYSARACEÆ.

12. TILMADOCHE Fr.

18. *Tilmadoche nutans* (Pers.) Rost. On decaying logs. Lincoln.

13. FULIGO Hall.

19. *Fuligo septica* (Link.) Gmel. On decaying logs. Crete.

14. PHYSARUM Pers.

20. *Physarum cinereum* (Batsch.) Pers. On stems and leaves (living or dead), common. Lincoln.

21. *Physarum contextum* Pers. On old wood. Lincoln.

22. *Physarum polymorphum* (Mont.) Rost. On decaying wood. Lincoln.

CLASS II.—SCHIZOMYCETES.

10. BACTERIACEÆ.

15. MICROCOCCUS Cohn.

23. *Micrococcus amylovorus* Burrill. Apple and pear blight. In twigs and leaves, common. Causing the leaves to early turn brown and fall. Lincoln.

24. *Micrococcus ureæ* Cohn. In stale urine.

16. BACTERIUM Cohn.

25. *Bacterium termo* Dujardin. In putrid water, common. Lincoln.

17. LEPTOTHRIX Kutzing.

26. *Leptothrix buccalis* Robin. In decaying teeth, common.

18. SPIRILLUM Ehrenberg.

27. *Spirillum rugula* Winter. In stagnant and putrid water. Lincoln. (Bessey.)

28. *Spirillum undula* (Muller) Ehrb. In putrid water, common. Lincoln.

19. **BEGGIATOA** Trevisan.

29. *Beggiatoa alba* (Vaucher) Trevisan. var. *marino* Cohn. With threads of algæ in brackish water, common. Lincoln.

NOTE.—Besides the above species, certain pathogenous forms are known to occur, as those accompanying and likely producing the diseasees known as dipthera, consumption, small-pox, hog-cholera, Texas fever, the corn germ of Dr. Billings, etc.

CLASS III.—CYANOPHYCEÆ. THE GREEN SLIMES.

11. CHROOCOCCACEÆ.

20. **MERISMOPEDIA** Meyen.

30. *Merismopedia glauca* Næg. Common. Lincoln; Thedford. August.

31. *Merismopedia violacea* (Breb.) Ktz. Thedford, August 7, 1889. Quite common in stagnant ponds, forming violet or purplish slimy masses that sometimes reaches the size of a man's hand. In appearance it much resembles floating particles of decaying flesh, in this respect being similar to *Chlamydococcus pluvialis* A. Br., from which it is with difficulty distinguished without the aid of a microscope. (The latter I collected in quantity in a pond in Wessington Hills, Dakota, last April. The color is a somewhat deeper violet purple.) This interesting little plant has not been found before in America, so far as known. It is distinguished from known American species by its smaller size and violet color.

21. **CHROOCOCCUS** Næg.

32. *Chroococcus cohærens* Næg. Common in stagnant ponds. Thedford, August 7, 1889.

12. NOSTOCACEÆ.

22. **SPIRULINA** Link.

33. *Spirulina tenuissima* Kg. Stagnant water. August. Lincoln.

23. **OSCILLARIA** Bosc.

34. *Oscillaria froelichii* Kg. Ponds and creeks. Lincoln.

35. *Oscillaria tenuis* Ag. Ponds, etc., common, Lincoln.

24. **CYLINDROSPERMUM** Kg.

36. *Cylindrospermum flexuosum* Rab. Streams, etc. November. Lincoln.

25. **ANABÆNA** Bory.

37. *Anabæna flos-aquæ* Kg. var. *circinalis* (Rab.) Kirch. In ponds, common. Lincoln.

26. **NOSTOC** Vauch.

38. *Nostoc commune* Vauch. On wet ground and wood, common. Lincoln; Culbertson.

39. *Nostoc pruniforme* Ag. Very common, in stagnant ponds. Thedford, August 7. Forming olive or dark brown, nearly regular balls, from 1^{mm} in diameter to the size of a plum.

ZYGOPHYTA.

CLASS I.—ZOOSPOREÆ.

13. PALMELLACEÆ.

27. **SCENEDESMUS** Meyen.

40. *Scenedesmus acutus* Meyen. In aquarium. Lincoln.

41. *Scenedesmus caudatus* Corda. var. *typicus* Kirch. Very common in ponds, aquaria, etc. Lincoln; Thedford, August 7.

42. *Scenedesmus dimorphus* Kg. In stagnant ponds, etc. Thedford, August 7, Lincoln.

43. *Scenedesmus obtusus* Meyen. Very common in ponds, presenting a number of forms. Thedford, August 7; Lincoln.

28. PEDIASTRUM Meyen.

44. *Pediastrum angulosum* (Ehrb.) Menegh. In ponds, not uncommon. Thedford, August 7.

45. *Pediastrum boryanum* (Turp.) Menegh. Common in ponds. Thedford, August 7.

29. RAPHIDIUM Kg.

46. *Raphidium convolutum* (Corda.) Rab. In stagnant water, not common. Lincoln, October 11.

47. *Raphidium polymorphum* Fres. var. *aviculare* A. Br. In aquarium. Lincoln.

48. *Raphidium polymorphum* Fres. var. *sigmoideum* Rab. In stagnant pools and aquaria. Thedford, August 7. Lincoln.

30. POLYEDRIUM Næg.

49. *Polyedrium trigonum* Nfg. var. *punctatum* Kirch. Rare. A plant found at Thedford, August 7, I take to be this variety.

50. *Polyedrium longispinum* (Pertz.) Rab. In aquarium. Lincoln.

51. *Polyedrium reinschii* Rab. With eight spines, obtuse. In stagnant water. Lincoln.

31. CHARACIUM A. Br.

52. *Characium nægelii* A. Br. On filaments of *Mesocarpus*. Lincoln.

32. PLEUROCOCCUS Menegh.

53. *Pleurococcus dissectus* (Kg.) Næg. (*Protococcus viridis* Ag. var. *dissectus* Næg.) On moist decaying wood. Saltillo. P.

54. *Pleurococcus miniatus* (Kg.) Næg. On damp earth in greenhouse. Lincoln.

33. PROTOCOCCUS Ag.

55. *Protococcus viridis* Ag. On bark of trees, etc., common. Lincoln. A deep green aquatic variety is quite common in ponds at Thedford.

34. EUGLENA Ehrb.

56. *Euglena viridis* (Schrank.) Ehrb. In stagnant water, very common. Lincoln; Thedford.

14. PITHOPHORACEÆ.

35. PITHOPHORA Wittr.

57. *Pithophora œdogonia* (Mont.) Wittr. var. *vaucherioides* (Wolle.) Wittr. In stagnant pools. Lincoln.

15. CLADOPHORACEÆ.

36. CLADOPHORA Kg.

58. *Cladophora canalicularis* Kg. In creeks, etc., common. Lincoln.

59. *Cladophora fracta* (Dillw.) Kg. var. *gossypina* (Draparn.) Rab. Stagnant water. Lincoln.

60. *Cladophora glomerata* L. Common in streams. Lincoln.

16. ULOTHRICHIACEÆ.

37. CONFERVA Lk.

61. *Canferva inequalis* Rab. A form found in the artesian well basin (salt), of

Lincoln, I take to be this species, although it was not given by Wolle in his "Fresh Water Algæ."

62. *Conferva vulgaris* Rab. var. *farlowii* Wolle. Very rank in aquarium. Water from Salt creek near Lincoln.

38. STIGEOCLONIUM Kg.

63. *Stigeoclonium nanum* (Dillw.) Kg. On stones and stems in thermal water from engine. Lincoln.

39. HORMISCIA Fries.

64. *Hormiscia zonata* (Web. & Mohr.) Aresch. (*Ulothrix zonata.*) Lincoln.

17. ULVACEÆ.

40. ENTEROMORPHA Lk.

65. *Enteromorpha compressa* (L.) Grev. Salt basin, common. Lincoln.

66. *Enteromorpha intestinalis* (L.) Lk. Salt basin, common. Lincoln.

CLASS II.—CONJUGATÆ.

18. DESMIDIACEÆ. THE DESMIDS.

41. PENIUM Breb.

67. *Penium closterioides* Ralfs. Ponds, etc. Lincoln. (Bessey.)

42. CLOSTERIUM Nitsch.

68. *Closterium moniliferum* Ehrb. In pools. Lincoln.

69. *Closterium parvulum* Næg. In creek. Lincoln.

70. *Closterium striolatum* Ehrb. In creeks, etc. Lincoln.

43. DOCIDIUM Breb.

71. *Docidium baculum* (Breb.) D. By. Rare. Thedford, August 7.

44. COSMARIUM Corda.

72. *Cosmarium bioculatum* Breb. Not uncommon. Thedford, August 7.

73. *Cosmarium conspersum* Ralfs. Rare. Thedford, August 7.

74. *Cosmarium meneghinii* Breb. Rare. Thedford, August 7.

75. *Cosmarium nitidum* De Not. Rare. Thedford, August 7.

76. *Cosmarium pulcherrimum* Nord. Rare. Thedford, August 7.

77. *Cosmarium undulatum* Corda. Rare. Thedford, August 7.

45. EUASTRUM Ehrb.

78. *Euastrum verrucosum* Ehrb. Apparetly common. Thedford, August 7.

46. STAURASTRUM Meyen.

79. *Staurastrum gracile* Ralfs. Common. Thedford, August 7.

80. *Staurastrum polymorphum* Breb. Not uncommon. Thedford, August 7.

19. DIATOMACEÆ. THE DIATOMS.

(Species identified by Wolle.)

47. AMPHORA Ehrb.

81. *Amphora salina* W. Sm. In brackish ponds. Lincoln.

48. CYMBELLA Ag.

82. *Cymbella cymbriformis* Ehrb. var. *parva* (*Cocconema parvum* W. Sm.). Ponds, etc., artesian well.

83. *Cymbella gastroides* Kg. A large form, usually about 130 micromillimetres long. Ponds. Thedford, August 7.

49. STAURONEIS Ehrb.

84. *Stauroneis anceps* Ehrb. Artesian well (salt water). Lincoln.

50. NAVICULA Bory.
    - 85. *Navicula brebissonii* Kg. Ponds. Lincoln.
    - 86. *Navicula cryptocephala* Kg. Streams and ponds. Lincoln.
    - 87. *Navicula iridis* Ehrb. var. *amphigomphus* Ehrb. Stagnant ponds. Thedford, August 7.
    - 88. *Navicula lanceolata* Kg. In ponds. Lincoln.
    - 89. *Navicula major* Kg. Stagnant ponds, common. Thedford, August 7.
    - 90. *Navicula serians* Breb. Ponds. Lincoln.
    - 91. *Navicula sphærophora* Kg. Running streams and ponds. Lincoln.
    - 92. *Navicula viridis* Kg. Ponds. Lincoln.

51. PLEUROSIGMA W. Sm.
    - 93. *Pleurosigma intermedium* W. Sm. Rare. Thedford, August 7.

52. AMPHIPRORA Ehrb.
    - 94. *Amphiprora pulchra* Bail. In brackish ponds. Lincoln.

53. GOMPHONEMA Ag.
    - 95. *Gomphonema clavatum* Ehrb. Rare. Thedford, August 7. Length about thirty-two micromillimetres.
    - 96. *Gomphonema constrictum* Ehrb. Common in stagnant ponds. Thedford, August 7. (Length 32–64 micromillimetres.)
    - 97. *Gomphonema constrictum* Ehrb. var. *capitatum.* (*G. capitatum* Ehrb.) In ponds and streams. Lincoln.
    - 98. *Gomphonema gracile?* Ehrb. var. *dichotomum* (*G. dichotomum* W. Sm.). Ponds, etc., Lincoln.

54. COCCONEIS Grun.
    - 99. *Cocconeis pediculus* Ehrb. Common. Thedford, August 7. Frustule elliptical, 13–19 by 18–22 micromillimetres.

55. EPITHEMIA Breb.
    - 100. *Epithemia argus?* Kg. In ponds. Lincoln.
    - 101. *Epithemia gibba* Kg. Not uncommon in stagnant ponds. Thedford, August 7. Lincoln.
    - 102. *Epithemia turgida* (Ehrb.) Kg. Very common. Thedford, August 7. A beautiful form, from 46–91 micromilimetres long and usually about sixteen wide.

56. SYNEDRA Ehrb.
    - 103. *Synedra acus* (Kg.) Grun. In brackish ponds. Lincoln.
    - 104. *Synedra pulchella* Kg. var. *smithii* Ralfs. (*S. acicularis* W. Sm.) Ponds. Lincoln.
    - 105. *Synedra ulna* (Nitzsch) Ehrb. Common in streams and ponds. Lincoln; Thedford.
    - 106. *Synedra ulna* (Nitzsch) Ehrb. var. *splendens.* In streams. Lincoln.

57. FRAGILARIA Lyngbye.
    - 107. *Fragilaria harrisonii* (W. Sm.) Grun. In stagnant ponds. Thedford. Only one frustule found. Size, 14 by 22 micromillimetres.

58. MERIDION Ag.
    - 108. *Meridion circulare* Ag. Ponds and streams. Lincoln.

59. HANTZSCHIA Grun.
    - 109. *Hantzschia amphyoxis* (Ehrb.) Grun. var. *vivax.* (Hantz.) V. Heu. (*Nitzschia vivax* Hantzsch.) Ponds. Lincoln.

60. NITZSCHIA Grun.
    - 110. *Nitzschia sigmoidea* (Ehrb.) W. Sm. In brackish ponds. Lincoln.

specimens were collected by Dr. Bessey and myself at Belmont in July, 1889, and later, August 2, I found it plentifully in the northwestern part of Sioux county. Specimens were submitted to Dr. Coulter, who confirmed our identification.) Peck (Bot. Gazette, 1881, p. 226,) describes the pedicels of this species as very short. Careful examination of type specimens (Ellis N. A. F., 1448) show the hyaline pedicels to be *very deciduous*, *long*, and *fragile*. It was only by soaking the specimens an hour or so before scraping off the spores to mount that I was able to find the pedicels attached, and even then but seldom. They were usually about seventy-five micromillimetres long. In my fresh Nebraska specimens I find the pedicels frequently attached. They are very long, sometimes being nearly 200 micromillimetres.

385. *Puccinia lateripes* Berk. & Rav. II & III. On Ruellia (*Ruellia ciliosa*), Lincoln. Rare; apparently not very injurious to the host. Very inconspicuous.

386. *Puccinia lycii* Kalchbr. III. On matrimony vine (*Lycium vulgare*), Lincoln. Rare; not destructive. (Mr. Pound reports this as common.)

387. *Puccinia malvastri* Pk. III. On false mallow (*Malvastrum coccineum*), Phelps county; Chadron; Broken Bow, July 24; Belmont, July 25; Alliance, August 6. Quite common and destructive in the central and western parts of the state wherever the host is found. It forms on the leaves distinct, conspicuous, raised, light brown spots.

388. *Puccinia menthæ* Pers. II. On mountain mint or basil (*Pycnanthemum virginicum*), Hall county; wild sage (*Salvia azurea*), Lincoln. III. On wild sage (*Salvia azurea*), Lincoln. Not so common nor so destructive as the next. In appearance it is distinguished from the following by its usually more scattering, less frequent spore dots.

389. *Puccinia menthæ* Pers. var. *americana* Burrill. II. On wild bergamot (*Monarda fistulosa*), Belmont, July 20; Hat Creek basin, August 2; prairie bergamot (*Monarda citriodora* Cerv.), Ft. Robinson, July 31. III. On wild bergamot (*Monarda fistulosa*), Belmont, July 20; Hat Creek basin, August 2; Lincoln. A very common and destructive species. Spore dots usually very thickly scattered over the whole under surface of the leaf, frequently seeming to cover almost the whole surface, giving it a blackish velvety or powdery appearance, mottled with orange-yellow when stage II is present.

390. *Puccinia microsperma* B. & C. (*P. lobeliæ* Gerard). III. On great Lobelia (*Lobelia syphilitica*), Crawford, September 18. Not a very common species. Spore dots small, cinnamon brown, in irregular patches on the lower surface of the leaf. Not destructive.

391. *Puccinia nigrescens* Pk. III. On wild sage (*Salvia lanceolata*), Lincoln, October. Usually very common and destructive from October till the end of the season. Spore dots rather large, black, irregularly scattered, on stems, petioles, leaves, calyx, etc.

391½. *Puccinia obtecta* Peck. On great bulrush (*Scirpus lacustris*), Weeping Water. W.

392. *Puccinia phragmitis* (Schum.) Kornicke. II. On cord grass (*Spartina gracilis*), Camp Clark, Cheyenne county, August. III. On cord grass (*Spartina gracilis*), Camp Clark (with the preceding stage); marsh cord grass (*Spartina cynosuroides*), Lincoln; Geneva. Spore dots prominent, round to linear, on leaves, sheaths, etc. Remains of the epidermis rather prominent especially in stage II. Frequently quite destructive, especially when it attacks the heads or spikes, as it is sometimes observed to do.

393. *Puccinia pimpinellæ* (Straus.) Lk. III. On sweet cicely (*Osmorrhiza longistylis*), Milford. Rare, inconspicuous, not destructive.

269. *Lecanora chlorophana* (Wahl.) Ach. On rocks. Western and northwestern Nebraska. W.

270. *Lecanora fuscata* (Schrad.) Th. Fr. On sandstone: Weeping Water; Lincoln. W.

271. *Lecanora hageni* Ach. On rocks. Peru.

272. *Lecanora melanaspis* (Wahl.) Ach. Rocks and earth. Northwestern Nebraska. W.

273. *Lecanora muralis* (Schreb.) Schær. On rocks over the state. W.

274. *Lecanora muralis* (Schreb.) Schær. var *garovaglii* Anz. Culbertson. W.

275. *Lecanora muralis* (Schreb.) Schær. var. *saxicola* Schær. Weeping Water; Lincoln. W.

276. *Lecanora muralis* (Schreb.) Schær. var. *versicolor* Fr. Weeping Water. W.

277. *Lecanora rubina* (Vill.) Ach. On rocks. Northwestern Nebraska. W.

278. *Lecanora rubina* (Vill.) Ach. var. *opaca* Ach. Fr. On rocks. New Helena.

279. *Lecanora subfusca* (L.) Ach. On logs, etc. Lincoln.

280. *Lecanora subfusca* (L.) Ach. var. *argentata* Ach. On trees. Weeping Water. W.

281. *Lecanora subfusca* (L.) Ach. var. *coilocarpa* Ach. Weeping Water, Lincoln. W.

282. *Lecanora subfusca* (L.) Ach. var. *distans* Ach. Weeping Water.

283. *Lecanora xanthophana* Nyl. On limestone. Weeping Water; Culbertson; Valentine, and northwestern Nebraska.

283½. *Lecanora xanthophana* Nyl. var. *dealbata* Tuck. On rocks. Ashland; Weeping Water; Valentine. W.

126. PLACODIUM (DC.) Næg. & Hepp.

284. *Placodium aurantiacum* (Lightf.) Næg. & Hepp. Rocks and trees. Common. Peru; Culbertson; Lincoln; Weeping Water.

285. *Placodium cerinum* (Hedw.) Næg. & Hepp. On hickory. Weeping Water. W.

286. *Placodium cerinum* (Hedw.) Næg. & Hepp. var. *pyracea* Nyl. On trees. Saltillo; Weeping Water. W.

287. *Placodium citrinum* (Hoff.) Leight. On rocks and earth. West Nebraska. W.

288. *Placodium ferrugineum* (Huds.) Hepp. var. *pollinii* Tuck. On trees. South Bend. W.

289. *Placodium fulgens* (Sw.) DC. On earth. Northwestern Nebraska. W.

290. *Placodium fulgens* (Sw.) DC. var. *bracteatum* Ach. Calcareous earth. Valentine. W.

127. LEPTOGIUM Fr., Nyl.

291. *Leptogium dactylinum* Tuck. Lime rocks. Ashland; Weeping Water; South Bend. W.

128. COLLEMA Hoffm., Fr.

292. *Collema aggregatum* Nyl. On rocks. Weeping Water. W.

293. *Collema crytaspis* Tuck. On trees. South Bend; Weeping Water; Ashland. W.

294. *Collema flaccidum* Ach. On trees. South Bend; Weeping Water; Ashland; Lincoln.

295. *Collema laciniatum* Nyl. On trees. Weeping Water, Saltillo. W.

296. *Collema leptaleum* Tuck. On trees. Weeping Water. W.

Sporobolus vaginæflorus differ considerably from the original description, but posses the peculiarity of bearing one and two celled teleutospores, either in the same sorus, or in different sori without intermixture. II. Uredospores mixed with the teleutospores rotund-elliptical, 34–36 by 30–40 micromillimetres. III. Sori on culms and usually the upper surface of the leaves, prominently surrounded by remains of the ruptured epidermis; teleutospores longer than usually described, 30.4–60.8 by 15–23 micromillimetres; pedicels also longer, usually as long or longer than the spore, 40–70 micromillimetres, almost hyaline. In the one-celled form the spores are also larger than described, 34–45.6 by 19–30 micromillimetres; pedicels ½–2 times as long as the spore, nearly colorless.)

401½. *Puccinia stipæ* Arthur. On porcupine grass (*Stipa comata*), Belmont, July 18.

402. *Puccinia tanaceti* DC. I. On wormwood or sage brush (*Artemisia cana*), Hat Creek basin, Sioux county, August 1; wormwood (*Artemisia canadensis*), Hat Creek basin, August 2. II. On wormwood (*Artemisia cana*), Hat Creek basin, August I. III. On wormwood (*Artemisia cana*), Hat Creek basin; wormwood (*Artemisia dracunculoides*), Lincoln; mountain sage brush (*Artemisia tridentata*), Hat Creek basin, August 2. A very common and destructive species in the northwestern part of the state. Stage I may be questioned as having connection with this species, but I think there can be but little doubt of it. Stages II and III were very common in Sioux county, and on the same plant, and same leaf frequently; stage I occurred also. On plants covered with II and III, frequently injured dried-up spots, as if old *æcidia* (I) occur. This is very likely the *Puccinia* sp. I & III stages found in Colorado in 1886 on *Artemisia mexicana* Willd., by Drs. Bessey and Halstead (Bot. Bull. Ia. Agr. Coll., 1886, p. 58). They inferred a connection between the stages. Mr Anderson, in "Notes on Fungi of Montana," Jour. of Myc. V., p. 33, says, "I have found one of the numerous *Æcidium compositarum* forms occurring with the uredo of *Puccinia tanaceti*, closely followed by the teleutospores. Mr. Cockerell, of Colorado, also infers a possible connection, although not finding the different stages associated on the same plant. Æcidia irregularly scattered on the leaves and stems, light orange-yellow, long (usually about one-half millimetre), somewhat resembling *Rœstelia;* peridial cells subrotund, angular, thick-walled, 15–21 by 19–26 micromillimetres. Æcidiospores orange-yellow, thin-walled, subrotund to elliptical, 11–19 by 17–23 micromillimetres, most commonly 15–19).

403. *Puccinia tanaceti* DC. var. *actinellæ* Webber (n. var.) (see Rusts and Smuts of Nebraska, Bull. Agr. Expt. Station of Nebraska, Vol. I, Art. No. 9, p. 55.) III. On leaves of Actinella (*Actinella acaulis*), Belmont, Dawes county, July 26; Hat Creek basin, Sioux county, August 2, 1889. (Amphigenous, sori more or less clustered, prominent orbicular-elliptical, ½–1 millimetre in diameter, somewhat confluent, frequently surrounded by remains of the ruptured epidermis; teleutospores very variable, broadly ovate-oblong, usually strongly constricted, smooth, thin-walled, 19–38 by 26–76 micromillimetres, mostly about 22 by 50; apex strongly pointed to rounded or truncate, usually somewhat thickened; pedicels hyaline or slightly tinted, robust, from 1–3 times as long as the spore. One and three celled spores occur quite frequently mixed with the normal ones. One celled, 19–26 by 28–53 micromillimetres; three celled, 19–22 by 50–76 micromillimetres. This differs from the normal *P. tanaceti* DC. in the great diversity of its spores and somewhat in the appearance and clustering of the sori and the tinting of the pedicels. It agrees equally well with Peck's *P. viguiereæ* Torr. Bull. XII, p. 35, which is distinguished from *P. tanaceti* merely by breadth of spores. It is also near *P. variolans* Hark. New. Cal. Fungi, p. 15. The last two it seems to me approach too near *P. tanaceti* to justify specific distinction. Mr. Seymour ("List of Fungi," Pro. Bost. Soc. of Nat. Hist., Vol. XXIV, 1889, p. 188) has referred this to *P. variolans* Hark.) (Figured in Am. Nat. 1890, p. 178, Pl. VII, Fig. 7, *a–n*.) Quite common and destructive in the northwestern part of the state where this host occurs.

404. *Puccinia tanaceti* DC. var. *vernoniæ* (Schw.) Burrill. II. On iron weed (*Vernonia fasciculata*); Anselmo, July 7. III. On iron weed (*Vernonia fasciculata*); Anselmo, July 7; Lincoln. Common, rather destructive. Frequently conspiciously blackening the under surface of the leaf with its numerous small spore dots.

405. *Puccinia thesii* (Desv.) Chaill. I and III. On bastard toad-flax (*Comandra pallida*); Dismal river, Thomas county, July 13, 1889. Amphigenous or mostly hypophyllous, spreading to the upper surface; æcidia on stem, leaves, and fruits, rather prominent whitish, densely crowded on thickened reddish-yellow spots or irregular indefinite patches; peridial cells rather longer than broad, usually 16-21 by 19-27 micromillimetres, strongly rugose or tuberculate; æcidiospores orange-yellow, slightly tuberculate, mostly subrotund 19–23 micromillimetres ; sometimes elliptical 19–23 by 19–27 micromillimetres ; uredo stage not found; teleutosori scattered on stems and leaves, prominent rotund ¼-¾mm. in diameter, somewhat confluent, conspiciously surrounded by the remains of the ruptured epidermis; teleutospores elliptical-oblong, slightly constricted, smooth, rather thin walled, 17–23 by 32–50 micromillimetres; apex rounded or somewhat pointed, thickened; pedicels slightly tinted 1–2½ times the length of the spores. I have no hesitation in placing my specimens here, although this species has not been reported before from America, and has only been known as occurring on *Thesium*, an old world genus. I have compared my specimens with those of Linhart and De Thuemen and find no noticeable difference (Linhart's Fungi, Hung., 319; DeThuemen's Myc. Univ. 1523.) The *Æcidium* on *Comandra umbellata* and *C. pallida* so common in the west, and commonly referred to *Æcidium pustulatum* Curt., is, in part at least, I think, nothing more than the first stage of this. Whether the original *Æ. pustulatum* is to be considered as belonging here or not, I am in doubt. They are surely very nearly related species. They agree in having reddish-yellow, thickened spots; few honey-yellow, epiphyllous spermogonia; densely crowded æcidia; and slightly tuberculate, same sized æcidiospores. They seemingly disagree in size of æcidia; that of *Æ. pustulatum* is described as short, and that of *P. thesii* as long. Of *P. thesii* DeToni says: "Æcidia as long as 750 micromillimetres;" Winter, "to ¾ millimetre high;" Schroeter, "more or less elongated cyndrical;" Plowright does not mention the length. The æcidia of *Æ. pustulatum* are described by Burrill (Par. Fungi, Ill. Ured., p. 237) as hypophyllous. Specimens distributed by Peck (De Thuemen Myc. Univ. 1424) have a few æcidia on the upper surface of the leaf showing a tendency to spread to that surface, but those distributed in Ellis N. A. F. 224, probably from the same place, do not show this. Kellerman and Swingle's specimens (Kansas Fungi, No. 29) have the æcidia as frequently epiphyllous as hypophyllous (! a western specimen). Thus it seems the difference in habit (epiphyllous or amphigenous) between the two species is of but little value as a differential character. All the difference found may reasonably be attributed to influence of climate and habitat.

406. *Puccinia vexans* Farlow. Gramma rust. II. (*Uredo boutelouæ* Arthur. —In Bull. Iowa Agrl. Coll., 1884). On bristly mesquite or gramma

(*Bouteloua hirsuta*), Crawford, July 28. III. On gramma (*Bouteloua oligostachya*), Lincoln; Dundy county; mesquite grass (*Bouteloua racemosa*), Polk county; Howard county; bristly mesquite grass (*Bouteloua hirsuta*, Lincoln; Crawford, July 28. A common but not very destructive species. (I have no hesitation in placing *Uredo boutelouæ* Arthur, as stage II of this species, having several times found the uredospores and teleutospores in the same sorus. Dr. Arthur suspected a connection and first described it as the uredo stage of *Uromyces brandegei* Pk. (See Bull. Minn. Acad. Nat. Sci. II.) Both the one and two celled teleutospore forms are common. My Crawford specimens are of the rugose type and have the pedicels somewhat tinted.

407. *Puccinia violæ* (Schum.) DC. Violet rust. I. On common blue violet (*Viola cucullata*), Lincoln; Ft. Robinson; larkspur violet (*Viola delphinifolia*), Lincoln; prairie violet (*Viola nuttallii*), Valentine. III. On common blue violet (*Viola cucullata*), Lincoln; larkspur violet (*Viola delphinifolia*), Lincoln. Quite a common species, the first stage of which is frequently destructive.

408. *Puccinia windsoriæ* Schw. Muhlenberg rust. II & III. On Muhlenberg's grass (*Muhlenbergia racemosa*), Lincoln, October 13. Very abundant and destructive this year. I had not noticed it before. Spore dots very numerous, blackish on the lower surface of the leaf.

409. *Puccinia xanthii* Schw. Cocklebur rust. III. On great ragweed (*Ambrosia trifida*), Lincoln; Roman wormwood (*Ambrosia artemisiæfolia*), Lincoln; common cocklebur, (*Xanthium canadensis*, Lincoln. Quite common and destructive, forming numerous, large, cinnamon-colored, swollen spots on the lower surface of the leaves.

410. *Puccinia* sp. Buffalo-grass rust. II & III. On buffalo grass (*Buchloe dactyloides*), Lincoln, October, 1886. Rare. Not destructive. (Amphigenous, or mostly hypophyllous. Sori elliptical-oblong, small, irregularly scattered, soon naked, the remains of the ruptured epidermis hardly conspicious; uredospores subglobose, smooth, 14–21 by 21–23 micomillimetres; teleutospores oblong-elliptical or slightly obovate, light brown, smooth, usually thin walled, 15–23 by 29–40 micromillimetes; apex obtusely rounded, slightly, if any, thickened; pedicels hyaline, rather robust, from 1–2½ times as long as the spores. On leaves and culms of *Buchloe dactyloides*, collected by J. G. Smith near Lincoln in 1886. This species was examined by Mr. Schofield, a student of the University of Nebraska, in the winter of 1887, and sent to Dr. Farlow for examination under the name *Puccinia buchloes*. We have as yet no answer. It is closely related to *P. vexans* Farlow, and may prove to be that species.)

150. UROPYXIS Schroet.

411. *Uropyxis amorphæ* (Curt.) Schroet. (*Puccinia amorphæ* Curt.) II. On false indigo (*Amorpha fruticosa*), Lincoln. III. On lead plant (*Amorpha canescens*), Lincoln. On false indigo (*Amorpha fruticosa*), Lincoln. Usually rather uncommon and not very destructive. In the fall of 1888 I found it, however, quite common on the lead plant, and apparently very injurious, as whole plants affected with it presented a withered appearance.

412. *Uropyxis petalostemonis* (Farl.) De Toni (*Puccinia petalostemonis* Farl.). II. On white prairie clover (*Petalostemon candidus*), Belmont, Dawes county, July 24. III. On red prairie clover (*Petalostemon violaceus*), Lincoln. Very plentiful in northwestern Nebraska, in patches destroying almost every plant. Found but rarely in the eastern part of the state.

151. GYMNOSPORANGIUM Hedwig.

413. ***Gymnosporangium clavariæforme*** (Jacq.) Rees. I. On service-berry or June-berry (*Amelanchier alnifolia*), Hat Creek basin, Sioux county, August 1; black or pear thorn (*Cratægus tomentosa*), Lincoln. In herb. Pound. (Since the publication of my List of the Rusts and Smuts of Nebr., Dr. Thaxter has examined specimens of this and pronounced my identification correct.)

414. ***Gymnosporangium macropus*** Link. "Cedar apple." III. On red cedar (*Juniperus virginiana*), Lincoln; Fremont. Common, frequently quite destructive, forming on the stems, round, brownish balls with small, finger-like projections, which when wet are large and conspicuous.

152. PHRAGMIDIUM Link.

415. *Phragmidium potentillæ* (Pers.) Karst. II & III. On cinque-foil (*Potentilla hippiana*), Belmont, Dawes county, July 25. A very beautiful species, not frequently occurring. Rather injurious to host. Stage II, light orange yellow; III, black; the two when associated on the same leaf forming a striking contrast.

416. *Phragmidium speciosum* Fr. Rose rust. II. On rose (*Rosa arkansana*), Lincoln; rose (species?), Anselmo, July 6. III. On rose (*Rosa arkansana*), Lincoln; rose (species?), Belmont, July 26. Not very common. Stage II forms a yellow powder on the lower surface of the leaves; and III, forms black knots on the stems.

153. COLEOSPORIUM Lev.

417. *Coleosporium solidaginis* (Schw.) Thuem. Golden rod rust. II. On golden-rod (*Solidago arguta*), Lincoln; golden-rod (*Solidago canadensis*), Lincoln; golden-rod (*Solidago rupestris*), Lincoln. III. On golden-rod (*Solidago canadensis*), Lincoln; golden-rod (*Solidago rupestris*), Lincoln. A very common and frequently destructive species.

418. *Coleosporium sonchi* (Pers.) Lev. II. On aster (*Aster ericoides*), Lincoln; aster (*Aster lævis* var. *lævigatus*), Weeping Water; aster (*Aster macrophyllus*), Lincoln; aster (*Aster sagittifolius*), Hat Creek basin, Sioux county, August 2. Common, not very destructive.

154. PUCCINIASTRUM Otth.

419. *Pucciniastrum epilobii* (Chaill.) Otth. (*Melampsora epilobii* (Pers.) Fuckel. II. On willow-herb (*Epilobium coloratum*), Hat Creek basin, Sioux county, August 2. Rather destructive, but does not occur very commonly. (Sori amphigenous, scattered, plentiful,—described usually as hypophyllous.)

155. ÆCIDIUM Pers.

420. *Æcidium abundans* Pk. On wolf berry (*Symphoricarpos occidentalis*), Hat Creek basin, Sioux county, August 3. A rare species; when occurring, quite destructive. Spore cups in spots on the lower surface of the leaf, the upper surface discolored light brown, or sometimes yellow or reddish.

421. *Æcidium æsculi* Ell. & Holw. On common horse-chestnut (*Æsculus hippocastanum?*), Lincoln. Rare, not destructive.

422. *Æcidium apocyni* Schw. On Indian hemp or dogbane (*Apocynum cannabinum*), Lincoln. Not common nor destructive.

423. *Æcidium asterum* Schw. On aster (*Aster sagittifolius*), Wymore. Occurring but rarely.

424. *Æcidium brandegei* Pk. On whorled milkweed (*Asclepias verticillata* var. *pumila*), Crawford, July 29; milkweed (*Asclepias arenaria*), Long Pine. In herb. Bessey. A rare species; on stems and leaves, distorting and swelling the host. Destructive.

425. *Æcidium cassiæ* Ell. & Kell. On partridge pea (*Cassia chamæcrista*), Lincoln. A rare species. P.

426. *Æcidium ceanothi* Ell. & Kell. On red-root (*Ceanothus ovatus*), Lincoln. Common. Rather destructive.

427. *Æcidium clematidis* DC. Clematis rust. On virgin's bower (*Clematis ligusticifolia*), Ft. Robinson, (in herb. Bessey); Dismal river, Thomas county, July 13; Belmont, July 18. Very common and destructive wherever the host occurs.

428. *Æcidium convallariæ* Schum. On great Solomon's seal (*Polygonatum giganteum*), Lincoln; false Solomon's seal (*Smilacina stellata*), Lincoln. Common. Frequently quite destructive.

429. *Æcidium compositarum* Mart. var. ——. On golden ragwort (*Senecio aureus*), Valentine.

430. *Æcidium compositarum* Mart. var. *eupatorii* (Schw.) Burrill. On Joe Pye weed (*Eupatorium purpureum*), Anselmo, Custer county, July 6. Not common. In definite spots, conspicuous, especially above.

431. *Æcidium compositarum* Mart. var. *helianthi* Burrill. On sunflower (*Helianthus doronicoides*), Wymore. Rare; not very destructive here.

432. *Æcidium compositarum* Mart. var. *lactucæ* Burrill. On wild lettuce (*Lactuca canadensis*), Lincoln.

433. *Æcidium compositarum* Mart. var. *liatridis* Webber n. var. (See Rusts and Smuts of Nebr., Bull. Agr. Expt. Station of Nebr., vol. I, art. No. 9, p. 60.) On blazing-star (*Liatris scariosa*), Anselmo, July 9; Belmont, July 25. Not uncommon. Destructive. (Amphigenous, or mostly hypophyllous; spots rather indefinite, thickened, usually occupying the whole width of the leaf and spreading from the upper and lower edges; æcidia in the middle of the spot crowded, on the edges becoming scattered, short, protruding but little, early breaking away, leaving the conical raised epidermal border with a nearly regular apical opening; æcidiospores light orange-yellow, smooth, suborbicular-elliptical, 14-21 by 19-26 micromillimetres, when orbicular usually about 18-22.)

434. *Æcidium compositarum* Mart. var. *lygodesmiæ* Webber n. var. (See Rusts and Smuts of Nebr., Bull. Agri. Expt. Station of Nebr., vol. I, art. No. 9, p. 61.) On Lygodesmia (*Lygodesmia juncea*), Belmont, Dawes county, July 26. A common form here. Very destructive, frequently distorting the whole plant, and by partially stopping the growth above, giving it a depressed, much branched appearance. (Amphigenous on leaves and stems; æcidia prominent, slightly hemisperical, opening by a small apical aperture; on the leaves somewhat clustered, or irregularly scattered; on the stems, crowded in usually elongated, distorted, thickened, patches; peridial cells angular-elliptical, usually strongly tuberculate; æcidiospores light orange yellow, slightly tuberculate, wall of medium thickness, subrotund-elliptical or ovate 20-23 by 22-27 micromillimetres; spermogonia not observed.) All specimens gathered are accompanied by two parasites (upon this parasite), *Darluca filum* (Biv.) Cast., and *Tuberculina persicina* (Ditm.) Sacc. The latter is very destructive, its smooth, violet colored spores completely filling up fully half of the pseudo-peridia, and injuring many more, destroying and taking the place of the æcidiospores.

435. *Æcidium corydalis* (E. & K.) Webber. (*Æcidium dicentræ* Trelease f. *corydalis* Ell. & Kell. In Ell. & Ev., N. A. F., vol. XV, No. 1435. Issued in 1885. *Æ. fumariacearum* Kell. & Swingle, Jour. of Myc., Sept., 1888, p. 95. On leaves of golden corydalis (*Corydalis aurea*). Rare. Lincoln.

436. *Æcidium daleæ* Kell. & Swing. On dalea (*Dalea laxiflora*), McCook; Anselmo, July 6. Rare. Not usually very destructive.

437. *Æcidium erigeronatum* Schw. On daisy fleabane (*Erigeron strigosus*), Lincoln; horse-weed or butterweed (*Erigeron canadense*), Lincoln, July 14. A very common and destructive species.

438. *Æcidium euphorbiæ* Gmel. On spurge (*Euphorbia sp.*), Long Pine (in herb. Bessey); Lincoln; Custer county; Thomas county; spurge or snow-on-the-mountain (*Euphorbia marginata*), Lincoln, May 28. A rather common species. Frequently destructive.

439. *Æcidium fraxini* Schw. Ash rust. On green ash (*Fraxinus viridis*), Lincoln; Anselmo, July 6. Some seasons very common and destructive; again apparently rare for several seasons.

440. *Æcidium grossulariæ* Schum. Gooseberry rust. On gooseberry (*Ribes rotundifolium*), Lincoln; Wymore; Weeping Water. A very common and frequently destructive species.

441. *Æcidium hibisciatum* Schw. On halberd-leaved rose mallow (*Hibiscus militaris*), Weeping Water.

442. *Æcidium hydrophylli* Pk. On waterleaf (*Hydrophyllum virginicum*), Weeping Water.

443. *Æcidium impatientis* Schw. On pale touch-me-not (*Impatiens pallida*), Dismal river, Thomas county, July 15. Very destructive, on petioles, stems, and leaves, variously swelling and distorting them.

444. *Æcidium iridis* Gerard. Iris rust. On common blue flag (*Iris versicolor*), Nebraska City.

445. *Æcidium jamesianum* Pk. On common milkweed (*Asclepias syriaca* L.), Anselmo, July 6; Broken Bow, July 4; milkweed (*Asclepias arenaria*), Dismal river, Thomas county, July 12; Belmont July 25. Very destructive, especially on *Asclepias arenaria*, distorting and rolling up the leaves of entire plants. In the eastern part of the state I have found this but rarely. In the "sand hills" and "bad lands," from central to western Nebraska, I found it in 1889 very common, affecting almost every plant.

446. *Æcidium lepidii* Tracy and Gal. On wild pepper grass (*Lepidium intermedium*), Lincoln. Rare.

447. *Æcidium lysimachiæ* (Schlecht.) Wallr. On loosestrife (*Steironema ciliatum*), Lincoln; Anselmo, July 6. Not noticeably injurious.

448. *Æcidium oxalidis* Thuem. On violet wood-sorrel (*Oxalis violacea*), Lincoln; Weeping Water. Rare. Mr. Williams reports this as common last year (1889) at Weeping Water.

449. *Æcidium pammelii* Trel. On spurge (*Euphorbia corollata*), Weeping Water. (In herb. Pound.) Spurge or snow-on-the-mountain (*Euphorbia marginata*), Anselmo, July 6.

450. *Æcidium peckii* DeToni. (*Æcidium œnotheræ* Pk.) On evening primrose (*Œnothera serrulata*), Lincoln; Anselmo, July 6; evening primrose (*Œnothera biennis*), Lincoln.

451. *Æcidium pentstemonis* Schw. Pentstemon rust. On pentstemon (*Pentstemon cobæa*), Lincoln; pentstemon (*Pentstemon cæruleus*), Antelope county; pentstemon (*Pentstemon grandiflorus*), Lincoln; Anselmo, July 6; pentstemon (*Pentstemon glaber*), Weeping Water; Broken Bow, July 4; Anselmo, July 6; Belmont, July 18; Fairbury, May 24. A very plentiful and destructive species.

452. *Æcidium polemonii* Pk. On phlox (*Phlox pilosa*), Weeping Water.

453. *Æcidium porosum* Pk. On vetch or tare (*Vicia americana* var. *linearis*), Lincoln. Common. Quite destructive.

454. *Æcidium psoraleæ* Pk. On psoralea (*Psoralea tenuiflora*), Lincoln; silver-leaf (*Psoralea argophylla*), Lincoln.

455. *Æcidium punctatum* Pers. On tall meadow-rue (*Thalictrum purpuras-*

cens), Lincoln. Spore cups equally distributed over the lower surface of the leaf, thus distinguished from *Æcidium sommerfeltii* Johanson, (*Æ. thalictri* Grev.,) with which it is often confounded.

456. *Æcidium pustulatum* Curt. (See *Puccinia thesii.*) On bastard toad-flax (*Comandra umbellata*), Lincoln. Common, rather destructive.

457. *Æcidium ranunculacearum* DC. On long-fruited anemone (*Anemone cylindrica*), Belmont, July 19. Common, rather destructive. Spore cups in definite spots.

458. *Æcidium ranunculi* Schw. On small-flowered crowfoot (*Ranunculus abortivus*), Lincoln. Rare. Spore cups equally distributed over the surface of the leaf, thus easily distinguished from the preceding on a related host.

459. *Æcidium sambuci* Schw. Elder rust. On common elder (*Sambucus canadensis*), Lincoln. Common, very destructive, greatly swelling and distorting large patches on the stems and leaves.

460. *Æcidium smilacis* Schw. On greenbrier (*Smilax hispida*), Milford; carrion-flower (*Smilax herbacea*), Anselmo, July 6. Quite abundant and destructive, especially on the latter host, forming on the leaves large distorted spots which soon decay and fall out. Also attacking and destroying young fruits.

461. *Æcidium sommerfeltii* Johanson (*Æ. thalictri* Grev.) On tall meadow-rue (*Thalictrum purpurascens*), Lincoln; Belmont, July 18, Not so common as the other species on this host. Spore cups in definite spots. Not very injurious.

462. *Æcidium urticæ* Schw. Nettle rust. On nettle (*Urtica gracilis*), Lincoln. I have found this but once in Nebraska. In the spring of 1885 it was very common and destructive.

463. *Æcidium verbenæ* Speg. Verbena rust. On prostrate vervain or verbena (*Verbena bracteosa*), Lincoln; hoary vervain (*Verbena stricta*), Lincoln; Anselmo; nettle-leaved or white vervain (*Verbena urticifolia*), Weeping Water. Common, frequently quite destructive.

464. *Æcidium xanthoxyli* Pk. Prickly ash rust. On prickly ash (*Xanthoxylum americanum*), Weeping Water. On young fruits, destroying them. It also attacks the leaves.

156. **Uredo** Pers.

465. *Uredo agrimoniæ* (DC.) Schroet. On common agrimony (*Agrimonia eupatoria*), Belmont, Dawes county, July 20. Quite plentiful, frequently covering almost the whole lower surface of the leaf. Apparently not very injurious.

466. *Uredo cæoma-nitens* Schw. (*Cæoma luminatum* Schw.) Blackberry rust. On blackberry (*Rubus villosus*), Lincoln; black raspberry (*Rubus occidentalis*), Nebraska City, June. Very destructive. Conspicuous, covering the whole lower surface of the leaf with a dense orange-red powder (the spores).

Order Ustilagineæ.

42. USTILAGINEÆ.—THE SMUTS.

157. **Ustilago** Pers.

467. *Ustilago andropogonis* Kell & Swing. Blue stem smut. On big blue stem (*Andropogon provincialis*), Thedford, July 15; Anselmo, July 6; turkey-foot grass (*Andropogon hallii*), Dundy county, August. A common and destructive species, in the spikelets, destroying them, and forming a cylindrical black mass of spores; 7–10 millimetres long, 2–3 millimetres wide. Very near to *Sorosporium ellisii* Winter, if in-

deed it is to be distinguished from it. See in this list No. 487, and Seymour's "List of Fungi collected along the Northern Pacific railroad." Pro. Bost. Sc. Nat. Hist., Vol. XXIV, 1889. (Spores reddish brown, subglobose, slightly roughened, 9–17 by 9.5–21 micromillimetres.)

468. *Ustilago cesatii* Fisch. de Wald. (*Ustilago syntherismæ* Schw.) Sandbur smut. On sandbur (*Cenchrus tribuloides*), Lincoln, November 10. Common. It attacks the head of the grass, forming a black cylindrical spore mass covered by a papery membrane, which soon breaks away. Very destructive, frequently killing every head in large patches of the host plant. (Spores brownish, smooth, round, or sometimes polygonal; 7–12 micromillimetres.)

469. *Ustilago echinata* Schroeter. On reed canary grass (*Phalaris arundinacea*), Lincoln, September. A rare species, but when occurring, quite destructive to the tissue of the leaves, and destroying the heads. (Spores echinulate, orbicular, sometimes [but seldom] ovate or elliptical; 14–18 micromillimetres in diam., when ovate or elliptical, 18–19 micromillimetres long.)

470. *Ustilago hypodytes* (Schlecht.) Fr. (*Ustilago minima* Arthur.) On porcupine grass (*Stipa comata*), Belmont, Dawes county, July 26. A rare species. Usually in the outer tissue of the stem, beneath the leaf sheath, appearing above the sheath as a black powder on the stem. Also destroying the head or needles and seeds of the grass by attacking the head stem (*rachis*) and stopping its growth, converting it into a seemingly long cylindrical blackish spore mass. (Spores reddish brown, smooth, rotund or subrotund, somewhat angular, small 3.5–5 or 6 micromillimetres in diam.) (*Ustilago minima* Arthur, Bull. Iowa Agri. Coll., 1884, p. 172, must very probably be considered as belonging here. Apparently the only difference between the two species is in the portions of the plant attacked, *Ustilago hypodytes* attacking the culms and *Ustilago minima* the inflorescence. In specimens of *U. minima* [in herb. Bessey] identified by Arthur, the fungus attacks the rachis of the spike and destroys it as in my specimens, and it as frequently attacks the culms also beneath the leaf sheaths. The destruction of the inflorescence is in both cases secondary, and is caused by the destruction of the upper culms or rachis. I have compared both my own specimens and those of Arthur with De Thuemen, Myc. Univ. 820 and 1818; De Thuemen, Herb. Mycol. Oecon. 162; Linhart Fung. Hung. 104; and find no noticeable characteristic difference.)

471. *Ustilago lineata* Cke. On wild rice (*Zizania aquatica*), Howard county, September. Not an uncommon species. Produced in the tissue of the leaves, forming short, line-like, bluish black patches, which remain covered by the epidermis of the leaf. The patches are rather inconspicuous, but show on both sides of the leaf. Not very destructive. (Spores irregular, orbicular, often elliptical or polygonal, smooth, lightish brown; 6–9 micromillimetres in diameter.)

472. *Ustilago maydis* (DC.) Corda. (*U. zeæ mays* Wint.) Corn smut. On Indian corn (*Zea mays*). Common wherever corn is grown. Its appearance is too well known.

473. *Ustilago neglecta* Niessl. Foxtail smut. On yellow foxtail (*Setaria glauca*), Lincoln; green fox-tail (*Setaria viridis*), Lincoln. Very common and destructive, converting the seeds into a black mass of powdery spores. (Spores light brown, echinulate, globose-elliptical, or ovate; 7–11 by 9–16 micromillimetres.)

474. *Ustilago panici-miliacei* (Pers.) Wint. (*U. destruens* (Duby) Schlecht. On old witch grass (*Panicum capillare*), Lincoln, October 6. Common, destroying the heads of the grass similar to *Ustilago cesatii*, No. 468. (Spores brown, irregular, roundish, sometimes polygonal, smooth or

slightly roughened; 7–11 micromillimetres in diameter. See Ellis & Evh. N. A. Fungi, 2260.)

475. *Ustilago parlatorei* Fisch de Wald. Dock smut. On pale dock (*Rumex britannica*), Lincoln, May 14, 1889. Somewhat rare. When occurring it is very destructive. In petioles (leaf stems) and stems, variously swelling and distorting the host. The purple, powdery spore mass, replacing the destroyed inner tissue, gives the stems, etc., the appearance of being stuffed. In places it ruptures the epidermis, and spreading the ruptured edges, forms conspicuous, large, elongated, purple, powdery patches. (Spores, globose or subglobose, reticulated light purple; 9–16 micromillimetres in diameter. A German species not before reported from America.)

476. *Ustilago rotundata* Arthur. On switch grass (*Panicum virgatum*), Lincoln, October. Somewhat rare. Produced in the seeds, destroying them. It does not affect the external appearance of the head or flower, therefore inconspicuous and hard to find. (Spores commonly orbicular, sometimes ovate, dark, very finely echinulate; large, 18–20 micromillimetres in diameter.)

477. *Ustilago segetum* (Bull.) Dittm. Grain smut. On wheat (*Triticum vulgare*), Lincoln; oats (*Avena sativa*), Lincoln; Crete; Belmont, July 19. Too common everywhere. Destroys the grain, replacing it with a black powder (the spores).

478. *Ustilago sorghi* (Link.) Pass. Sorghum smut. On Millo maize (*Andropogon sorghum* var. *vulgaris*), grown on Experiment Station farm. Collected by J. G. Smith, September, 1889. Very destructive, attacking the seeds and converting them into an elongated, ovate column of spores (about 5 millimetres long by 2½ millimetres wide), surrounded by a rather firm, thickish membrane. (Spores subrotund, smooth, 6–8 micromillimetres in diameter.)

479. *Ustilago spermophora* B. & C. On stink or candy grass (*Eragrostis major*), Lincoln, October. Attacks the seeds, giving them a round or elliptical swollen appearance. Not a very common or destructive species here. (Spores orbicular or elliptical, dark purple, finely echinulate; 7–9 micromillimetres in diameter; when elliptical, as much as 10 micromillimetres long).

480. *Ustilago sphærogena* Burrill. On barn-yard grass (*Panicum crus-galli*), Lincoln, October. In Nebraska a rare species. Attacking the seed, it converts them into large roundish or somewhat egg-shaped (ovate) balls from 3 to 5, or when ovate 6, millimetres in diameter. Quite destructive to the injured heads, frequently killing every seed. (Spores slightly echinulate or verrucose, brownish, orbicular or suborbicular; 7–9 micromillimetres in diameter.)

481. *Ustilago utriculosa* (Nees) Tul. On smartweed (*Polygonum pennsylvanicum*), Lincoln, September 29. A somewhat rare species. Destructive when occurring. Produced in the seeds, swelling them, and forming within the seed coat, which soon bursts, a purple powdery mass of spores. (Spores orbicular, spinulose, reticulated, purplish, 7–9 micromillimetres in diameter.)

158. TILLETIA Tul.

482. *Tiletia fœtens* (B. &. C.) Trel. (*T. lævis*, Kueh. *Ustilago fœtens* B. & C. in Ravenel's Fungi Carol. Exsicc., V. 100, 1860.) Stinking smut or bunt. On wheat (*Triticum vulgare*), Lincoln; St. Paul; Custer county; Red Willow county; and probably throughout the state. A very common species. Produced in the grain of the wheat, destroying it. (Spores dull brown, rather thick walled, subrotund, ovate or elliptical, 15–20 micromillimetres in diameter; when elliptical, 15–18 by 20–23 micromillimetres; contents very coarsely granular.)

159. ENTYLOMA De Bary.

483. *Entyloma compositarum* Farlow. On golden ragwort (*Senecio aureus*), Lincoln, May 27. In the tissue of the leaves. Not very common or destructive. In herb. Bessey.

484. *Entyloma physalidis* (Kalchbr. & Cke.) Wint. On ground cherry (*Physalis lanceolata*), Lincoln, October 13. Not uncommon; usually not very destructive. In roundish spots, 2–7 millimetres in diameter. On the lower surface of the leaves they are whitish, on the upper surface brownish. (Spores light colored, orbicular, smooth; 9.5–14 micromillimetres; epispore rather thick, sub-hyaline.

160. SPHACELOTHECA De Bary.

485. *Sphacelotheca hydropiperis* (Schum.) De Bary. Smartweed smut. On smartweed (*Polygonum hydropiper*), Lincoln, October 10. Very common and destructive. In the seeds, flowers, etc., forming a somewhat irregular, pointed, ovate (egg-shaped), violet black spore mass, about five millimetres in length. These spore masses, in adjoining flowers, run together, more or less, frequently forming of the entire spike or flower head a very irregular, elongated, contorted spore mass. (Spores orbicular-elliptical, somewhat irregular, smooth, or slightly roughened; 7–11 micromillimetres.)

161. DOASSANSIA Cornu.

486. *Doassansia alismatis* (Nees) Cornu. On water plantain (*Alisma plantago* var. *americanum*), Weeping Water. Spots on the leaves and stems, roundish, yellowish, crowded with brown dots. Rare in Nebraska. P.

162. SOROSPORIUM Rud.

487. *Sorosporium ellisii* Wint. var. *occidentalis* Seymour. "List of Fungi." Pro. Bost. Soc. Nat. Hist., Vol. XXIV, 1889, p. 190. Blue-stem smut. On big blue stem (*Andropogon provincialis*), Lincoln, October, 1888. Common and destructive. In the secondary heads or spikelets of the grass, converting them into an elongated, cylindrical spore mass, 8–20 millimetres long by 3–4 millimetres wide, having much the appearance of the ergot of rye. This is inclosed in a light brown, papery membrane, which finally bursts and falls away (in part, at least). (Spores subglobose, slightly roughened, 7.6–9.5 by 7.6–11.4 micromillimetres.) Specimens of this referred to Kellerman were pronounced to be *Ustilago andropogonis* K. & S. Whether this species is to be distinguished from *Sorosporium ellisii* or not, I am unable to decide. What seem to be two different forms are found here. My specimens on *Andropogon provincialis* from Thedford and Anselmo agree perfectly with the description of *Ustilago andropogonis* K. & S. Those from Lincoln have smaller spores and agree well with Seymour's description of *Sorosporium ellisii* var. *occidentalis*.

488. *Sorosporium ellisii* Wint. var. *provincialis* Ell. & Ev. (Ell. & Ev. N. A. F. No. 2425.) On big blue stem (*Andropogon provincialis*), Broken Bow, Custer county, July 4, 1889. Common, destroying the spikes. In outward appearance it much resembles typical specimens of *S. ellisii* Wint., but differs greatly in microscopic characters. (Spores smooth, irregular, subrotund to elliptical, small, 5.7–9.5 by 7.6–11.4 micromillimetres.) This is the form placed questionably under *Sorosporium ellisii* in my enumeration of the rusts and smuts of Nebraska (Bull. Agri. Expt. Station of Nebraska, Vol. I, Art. No. 9, p. 72.)

Order Gymnomycetes.

43. EXOASCEÆ.

163. EXOASCUS Fuckel.

489. *Exoascus deformans* (Berk.) Fuckel. On peach leaves and plums, Lincoln. Common, frequently doing considerable damage.

Order Saccharomycetes.

44. SACCHAROMYCETES.

164. SACCHAROMYCES.

490. *Saccharomyces apiculatus* Reess. In grape juice, common. Lincoln.

491. *Saccharomyces cerevisiæ* Meyen. The yeast plant which produces the fermentation of "yeast." Common in fermenting juices. Lincoln.

492. *Saccharomyces conglomeratus* Reess. In grapes beginning to decay. Lincoln. P.

493. *Saccharomyces ellipsoideus* Reess. In fermenting grape juice, very common. Lincoln.

494. *Saccharomyces minor* Engel. In sour dough. Lincoln. P.

495. *Saccharomyces pastorianus* Reess. In juice of apple. Lincoln. P.

496. *Saccharomyces sphæricus* Sacc. In juice of tomato. Lincoln. P.

45. STERILE FORMS.

(Supposed to be stages of Ascomycetes.)

165. SCLEROTIUM Tode.

497. *Sclerotium durum* Pers. On decaying stems of *Hibiscus esculentus*; rare. Lincoln. P.

166. RHIZOMORPHA Roth.

498. *Rhizomorpha subcorticalis* Pers. Under bark of old logs, etc., common. Lincoln. (Almost certainly known to be a stage of *Armillaria mellea* Vahl.)

167. RHIZOCTONIA DC.

499. *Rhizoctonia medicaginis* DC. On roots of lucerne (*Medicago sativa*), Lincoln. Somewhat rare. P.

168. OZONIUM Lk.

500. *Ozonium auricomum* Lk. Common on decaying wood and old trunks, Lincoln.

501. *Ozonium stuposum* Pers. On decaying planks in old sidewalk, Lincoln. P.

Order Sphæropsideæ.

46. SPHÆRIOIDEÆ.

169. PHYLLOSTICTA Pers.

502. *Phyllosticta ampelopsidis* Ell. & Mart. On leaves of Virginia creeper (*Parthenocissus quinquifolia*), Weeping Water. P.

503. *Phyllosticta antennariæ* Ell. & Ev. On everlasting, or ladies' tobacco (*Antennaria plantaginifolia*), Weeping Water. P.

504. *Phyllosticta labruscæ* Thuem. On leaves of wild grape (*Vitis riparia*), Lincoln.

505. *Phyllosticta lycii* Ell. & Kell. On matrimony vine (*Lycium vulgare*), Lincoln. P.

506. *Phyllosticta minutissima* Ell. & Ev. (n. sp. in lit.) On leaves of mountain maple (*Acer glabrum*), Hat Creek basin, Sioux county, August 1, 1889. Spots conspicuous, irregular, roundish, from 5–9 millimetres in diameter, more or less confluent, usually bordered by an irregular yellowish orange band. Very common and apparently quite destructive.

507. *Phyllosticta phaseolina* Sacc. On leaves of wild bean (*Phaseolus diversifolius*), Lincoln. P.

508. *Phyllosticta populina* Sacc. On leaves of cottonwood (*Populus monilifera*), Lincoln. P.

509. *Phyllosticta violæ* Desm. On pansy (*Viola* sp.), Lincoln. P.

170. PHOMA Fr.

510. *Phoma longissima* (Pers.) West. In stems of goose-foot or pig-weed (*Chenopodium album*), Lincoln; atriplex (*Atriplex patula*), Lincoln; amaranth (*Amarantus retroflexus*), Lincoln. Common, forming usually irregular oblong whitish-pallid spots with a black border.

511. *Phoma negundinicola* Thuemen. On stem of box-elder (*Negundo aceroides*), Lincoln; Saltillo. Very common.

512. *Phoma lupini* Ell. & Ev. On lupine (*Lupinus plattensis*), Fort Robinson; Belmont, July 23; Hat Creek basin, Sioux county. Very common and destructive. On the lower surface of the leaf, giving it a more or less blackish velvety appearance.

171. ASTEROMA DC.

513. *Asteroma euphorbiæ* Fuckel. On dead stems of snow-on-the-mountain (*Euphorbia marginata*), Lincoln. Forming irregular dull black or brownish patches.

172. VERMICULARIA Fr.

514. *Vermicularia dematium* (Pers.) Fr. On stems of various weeds, Lincoln. P.

173. SPHÆROPSIS Lev.

515. *Sphæropsis macluræ* Cooke. On stems of Osage orange (*Maclura aurantiaca*), Lincoln. Common, apparently not destructive.

516. *Sphæropsis menispermi* Peck. On dead stems of moon seed (*Menispermum canadensis*), Lincoln.

517. *Sphæropsis smilacis* Ell. & Ev. (Jour. of Myc., Vol. V, p. 149. A new species from Nebraska.) On dead stems of green-brier (*Smilax hispida*), Lincoln, November, 1888. Common. ("Perithecia scattered, buried in the substance of the bark, bursting the cuticle, but only partially erumpent. Sporules oblong, brown, obtuse, 15–20 by 6–8 micromillimetres.")

174. HAPLOSPORELLA Speg.

518. *Haplosporella euonymi* Ell. & Ev. (Jour. of Myc., Vol. V, p. 149. A new species from Nebraska.) On dead stems of burning bush or Washoo (*Euonymous atropurpureus*), Peru, March, 1889. ("Stromata scattered or seriate, erumpent, and loosely surrounded by the ruptured epidermis, hemispherical or oblong, 1–2 millimeters in diameter, subtruncate and finally whitish above. Perithecia entirely inclosed in the stroma with thin subevanescent walls, and appearing on a cross section more like cells than like perithecia; ostiola obscurely papilliform. Sporules oblong, very slightly narrowed in the middle (possibly becoming 1-septate), 10–14 by 6–8 micromillimetres, brown, on slender basidia, 70–80 micromillimetres long. On the smaller twigs the stromata are smaller, but the sporules larger, 18–22 by 10–12 micromillimetres.")

175. DIPLODIA Fr.

519. *Diplodia atrata* (Desm.) Sacc. On stems of box-elder (*Negundo aceroides*), Lincoln.

176. ASCOCHYTA Lib.

520. *Ascochyta smilacis* Ell. & Ev. On leaves of greenbrier (*Smilax hispida*), Lincoln.

177. ACTINONEMA Fries.

521. *Actinonema rosæ* (Lib.) Fr. On leaves of cultivated rose, Lincoln. P.

178. DARLUCA Cast.

522. *Darluca filum* (Biv.) Cast. On *Uredineæ: Æcidium compositarum* var. *lygodesmiæ*, Belmont, July 20; *Uromyces junci*, Broken Bow, July 4; *Puccinia rubigo-vera*, Crete. Common. In some cases apparently quite destructive to the rust.

179. SEPTORIA Fr.

523. *Septoria acerella* Sacc. On leaves of box-elder (*Negundo aceroides*), Lincoln.

524. *Septoria argyræa* Sacc. On silver-berry (*Elæagnus argentea* Pursh), Lincoln. P.

525. *Septoria atriplicis* (West) Fuckel. On goose-foot (*Chenopodium album*), Lincoln.

526. *Septoria atropurpurea* Peck. On aster, Lincoln. P.

527. *Septoria campanulæ* (Lev.) Sacc. On tall bell-flower (*Campanula americana*), Lincoln. P.

528. *Septoria cacaliæ* Ell. & Kell. On tuberous Indian plantain (*Cacalia tuberosa*), Lincoln; pale Indian plantain (*Cacalia atriplicifolia* L.), Nebraska City, June.

529. *Septoria cerasina* Peck. On choke cherry (*Prunus virginiana*), Lincoln.

530. *Septoria cerastii* Rob. & Desm. On mouse-ear chickweed (*Cerastium* sp.), Lincoln. P.

531. *Septoria cirsii* Niessl. On leaves of common thistle (*Cnicus altissimus*), Lincoln. P.

532. *Septoria cornicola* Desm. On dogwood (*Cornus asperifolia*), Lincoln. P.

533. *Septoria conspicua* Ell. & Mart. On loosestrife (*Steironema ciliatum*), Lincoln; Anselmo, July 6.

534. *Septoria cryptotæniæ* Ell. & Rau. On leaves of honewort (*Cryptotænia canadensis*), Lincoln. Very common.

535. *Septoria erigerontis* B. & C., f. *boltoniæ*. On leaves of Boltonia (*Boltonia glastifolia*), Lincoln.

536. *Septoria gaurina* Ell. & Kell. On evening primrose (*Gaura* sp.), Lincoln. P.

537. *Septoria graminum* Desm. On finger grass or crab grass (*Panicum sanguinale*), Lincoln. Rare. P.

538. *Septoria helenii* Ell. & Ev. On sneeze-weed (*Helenium hoopesii*), Weeping Water. P.

539. *Septoria lactucicola* Ell. & Mart. On wild lettuce (*Lactuca floridana*), Lincoln.

540. *Septoria leptostachya* Ell. & Mart. On leaves of lop-seed (*Phryma leptostachya*), Crete. P.

541. *Septoria lophanthi* Wint. On giant hyssop (*Lophanthus nepetoides*), Lincoln. P.

542. *Septoria ludwigiæ* Cooke. On false loosestrife (*Ludwigia polycarpa*), Lincoln.

543. *Septoria mentzeliæ* Ell. & Kell. On *Mentzelia lævicaulis*, Box Butte county.

544. *Septoria mimuli* Ell & Kell. On leaves of monkey flower (*Mimulus ringens*), Lincoln. P.

545. *Septoria nabali* B. & C. On rattlesnake root (*Prenanthes* sp.), Lincoln. P.

546. *Septoria œnotheræ* West. On evening primrose (*Œnothera biennis*), Lincoln.

547. *Septoria pileæ* Thuem. On clear weed (*Pilea pumila*), Lincoln; wood nettle (*Laportea canadensis*), Lincoln.

548. *Septoria polygonorum* Desm. On smart weed (*Polygonum pennsylvanicum*), Lincoln.

549. *Septoria pruni* Ellis. On leaves of plum (*Prunus americana*), Lincoln.

550. *Septoria rudbeckiæ* Ell. & Hals'd. On cone flower (*Rudbeckia laciniata*), Weeping Water. P.

551. *Septoria ribis* Desm. On leaves of gooseberry (*Ribes rotundifolium*), Lincoln. A very common species, sometimes quite destructive.

552. *Septoria rubi* West. On raspberry (*Rubus strigosus*), Lincoln; blackberry (*Rubus* sp.), Lincoln. Not uncommon.

553. *Septoria sambucina* Peck. On leaves of elderberry (*Sambucus canadensis*), Lincoln.

554. *Septoria saniculæ* Ell. & Ev. On leaves of sanicle (*Sanicula canadensis*), Lincoln; sanicle (*Sanicula marilandica*), Weeping Water.

555. *Septoria scrophulariæ* Peck. On leaves of figwort (*Scrophularia nodosa*), Lincoln. Very common, frequently quite destructive.

556. *Septoria scutellariæ* Thuem. On leaves of skull-cap (*Scutellaria lateriflora*), Lincoln. Rare.

557. *Septoria silenicola* Ell. & Mart. On leaves of starry campion (*Silene stellata*), Lincoln. P.

558. *Septoria speculariæ* B. & C. On leaves of Venus' looking-glass (*Specularia perfoliata*), Lincoln; Thedford. Not uncommon.

559. *Septoria symphoricarpi* Ell. & Ev. On leaves of wolf-berry (*Symphoricarpos occidentalis*), Lincoln. P.

560. *Septoria sisymbrii* Ell. On hedge mustard (*Sisymbrium* sp.), Lincoln. P.

561. *Septoria verbenæ* Rob. & Desm. On nettle-leaved vervain (*Verbena urticifolia*), Lincoln. P.

562. *Septoria violæ* West. On leaves of common violet (*Viola palmata* var. *cucullata*), Lincoln. P.

180. CORNULARIA Karst.

563. *Cornularia persicæ* (Schw.) Sacc. On bark of cherry, Weeping Water. (Williams & Pound.)

181. PHLEOSPORA Wallr.

564. *Phleospora anemones* Ell. & Kell. On long-fruited anemone (*Anemone cylindrica*), Weeping Water; Crete. Not uncommon.

47. LEPTOSTROMACEÆ.

182. PIGGOTIA B. & Br.

565. *Piggotia fraxini* B. & C. On green ash (*Fraxinus viridis*), Lincoln. Very common. Usually on fallen leaves, but sometimes attacking the fresh ones, forming irregular black patches.

183. LEPTOSTROMA Fr.

566. *Leptostroma hypophylla* B. & Rav. On leaves of honey locust (*Gleditschia triacanthos*), Lincoln. Very common, and apparently quite injurious.

184. DISCOSIA Fr.

567. *Discosia artocreas* (Tode.) Fr. On plane tree (*Platanus occidentalis*), Peru; oak (*Quercus* sp.), Lincoln. Quite common.

48. EXCIPULACEÆ.

185. KELLERMANNIA Ell. & Ev.
    - 568. *Kellermania yuccagena* Ell. & Ev. On yucca, or Spanish bayonet (*Yucca augustifolia*), Box Butte county; Anselmo, July 8; Dismal river, Thomas county, July 18; Belmont, July 21. Very common and destructive.

Order Melanconieæ.

49. MELANCONIEÆ.

186. GLŒOSPORIUM Desm. & Mont.
    - 569. *Glœosporium acerinum* West. On leaves of silver maple (*Acer dasycarpum*), Lincoln. Common.
    - 570. *Glœosporium ampelophagum* (Pass.) Sacc. On grapes (*Vitis*), Lincoln. P.
    - 571. *Glœosporium lagenarium* (Pass.) Sacc. var. *musarum* Ell. & Ev. (Jour. of Myc., vol. V, p. 155.) On banana rind, Lincoln.
    - 572. *Glœosporium orbiculare* Berk. On squash (*Cucurbita*), very common. Lincoln. November.
    - 573. *Glœosporium rubi* Ell. & Ev. On raspberry (*Rubus* sp.), Lincoln. P.
    - 574. *Glœosporium septorioides* Sacc. On leaves of red oak (*Quercus ruber?*), Weeping Water; bur oak (*Quercus macrocarpa*), Weeping Water, P.; scarlet oak (*Quercus coccinea*), Richardson county, August 25.
    - 575. *Glœosporium stenosporum* Ell. & Kell. On leaves of cottonwood (*Populus monilifera*), Lincoln. P.

187. MELANCONIUM Link.
    - 576. *Melanconium oblongum* Berk. On bark of butternut or white walnut (*Juglans cinerea*), Lincoln. Not common.

188. MARSONIA Fisch.
    - 577. *Marsonia castagnei* (Desm. & Mont.) Sacc. On white poplar (*Populus alba*), Lincoln. Common.
    - 578. *Marsonia martini* Sacc. & Ell. On leaves of bur oak (*Quercus macrocarpa*), Lincoln; Weeping Water.

Order Hyphomycetes.

50. MUCEDINEÆ.

189. OOSPORA Wallr.
    - 579. *Oospora albipes* (Peck.) Sacc. On decaying wood, Lincoln. P.
    - 580. *Oospora lactis* (Fres.) Sacc. In water containing coffee, Lincoln. P.

190. MONILIA Pers.
    - 581. *Monilia aureofulva* C. & E. On decaying wood, Lincoln; York.
    - 582. *Monilia fructigena* Pers. On apple peelings, Lincoln. P.
    - 583. *Monilia martinii* Ell. & Sacc. On corn cobs and decaying corn stems, Lincoln. P.
    - 584. *Monilia megalospora* (B. & C.) Sacc. On decaying wood, Brownville.
    - 585. *Monilia mycophila* Sacc. On agarics, Lincoln. P.

191. CYLINDRIUM Bon.
    - 586. *Cylindrium elongatum* Bon. On leaves of oak (*Quercus* sp.), Peru.

192. OIDIUM Link
    - 587. *Oidium erysiphoides* Fr. On leaves of spiderwort (*Tradescantia virginica*), stickseed (*Echinospermum redowskii*), and cuckle-bur (*Xanthium canadensis*), Lincoln. Common.

193. TRICHODERMA Pers.

588. *Trichoderma lignorum* (Tode.) Harz. (*T. virde* Pers.) On bark of trees, dead leaves, etc., Lincoln.

194. RHINOTRICHUM Corda.

589. *Rhinotrichum curtisii* Berk. On decaying wood, Lincoln.

590. *Rhinotrichum repens* Preuss. On old trunks, Lincoln. P.

195. SPOROTRICHUM Link.

591. *Sporotrichum elæochroum* Fr. On fruits of rose, Lincoln. P.

592. *Sporotrichum himantiæ* Schw. On corn and grape stems, Lincoln. P.

593. *Sporotrichum roseum* Lk. On bread, Lincoln. P.

594. *Sporotrichum solubile* Schw. On decaying tomato, fallen leaves, etc., Lincoln.

595. *Sporotrichum sulphureum* Grev. On vinegar keg, Lincoln. P.

196. BOTRYTIS Michx.

596. *Botrytis atro-viridis* C. & E. On oak limbs, Lincoln. P.

597. *Botrytis bassiana* Bals. var. *tenella* Sacc. On wasps and beetles in breeding cages, etc., Lincoln. Common.

598. *Botrytis cinerea* Pers. On decaying fungi, Lincoln. P.

599. *Botrytis cinerella* Sacc. On hickory bark, Lincoln. P.

600. *Botrytis vulgaris* Fr. On fig, Lincoln. P.

197. OVULARIA Sacc.

601. *Ovularia obliqua* (Cke.) Oud. (*Ramularia obovata* Sacc.) On dock (*Rumex crispus*), Lincoln. P.

198. SEPEDONIUM Link.

602. *Sepedonium chrysospermum* (Bull.) Fr. On *Polyporus*, Lincoln. P.

603. *Sepedonium flavidum* Sacc. & Ell. On *Trametes*, Lincoln. P.

199. VERTICILLIUM Nees.

604. *Verticillium candidum* Peck. On decaying wood, Lincoln. P.

605. *Verticillium glaucum* Bon. On decaying nuts, Lincoln. P.

606. *Verticillium lateritium* Berk. On bread, Lincoln. P.

200. ACROSTALAGMUS Corda.

607. *Acrostalagmus cinnabarinus* Corda. On decaying banana, Lincoln. P.

201. TRICOTHECIUM Link.

608. *Trichothecium roseum* Pers. On various decaying substances, Lincoln.

202. DIDYMARIA Corda.

609. *Didymaria astragali* (Ell. & Hol.) Sacc. (*Ramularia astragali* Ell. & Hol.) On wild pea (*Astragalus canadensis*), Lincoln.

203. DACTYLIUM Nees.

610. *Dactylium dendroides* (Bull.) Fr. On corn and decaying fungi, Lincoln. P.

204. RAMULARIA Ung.

611. *Ramularia apiculata* Ell. & Ev. (n. sp. in lit.) Forming white mealy patches on leaves of common violet (*Viola palmata* var. *cucullata*), Lincoln. P.

612. *Ramularia armoraciæ* Fuckel. On horse-radish (*Nasturtium armoracia*), Lincoln. P.

613. *Ramularia arvensis* Sacc. On cinque-foil (*Potentilla norvegica*), Lincoln. P.

614. *Ramularia celastri* Ell. & Mart. On bitter-sweet (*Celastrus scandens*), Lincoln.

615. *Ramularia celtidis* Ell. & Kell. On hackberry (*Celtis occidentalis*), Lincoln. P.

616. *Ramularia dicipiens* Ell. & Ev. On dock (*Rumex crispus*), Lincoln. Common.

617. *Ramularia grindeliæ* Ell. & Kell. On fetid gum plant (*Grindelia squarrosa*), Lincoln. P.

618. *Ramulari mimuli* Ell. & Kell. On monkey-flower (*Mimulus ringens*), Lincoln. P.

619. *Ramularia plantaginis* Ell. & Mart. On plantain (*Plantago major*), Lincoln.

620. *Ramularia tulasnei* Sacc. On leaves of strawberry (*Fragaria virginiana* var. *illinoensis*), Lincoln; wild strawberry (*Fragaria vesca*), Anselmo, July 6.

621. *Ramularia urticæ* Ces. On leaves of nettle (*Urtica gracilis*), Lincoln. P.

622. *Ramularia virgaureæ* Thuem. On leaves of golden-rod (*Solidago rigida* and *S. nemoralis*), Lincoln. P.

205. PERICULARIA Sacc.

623. *Pericularia grisea* (Cke.) Sacc. On leaves of finger grass (*Panicum sanguinale*), Lincoln; Muhlenberg grass (*Muhlenbergia racemosa*), Lincoln (P.); rice cut-grass (*Leersia virginica*), Lincoln; panic grass (*Panicum dichotomum*), Lincoln (P.); yellow fox-tail (*Setaria glauca*), Lincoln (P.); millet (*Setaria italica*), Lincoln (P.).

206. CERCOSPORELLA Sacc.

624. *Cercosporella chionea* (Ell. & Kell.) Sacc. (*Cercospora chionea* Ell. & Kell.) On red-bud (*Cercis canadensis*), Lincoln; Richardson county. Very common and destructive, forming large, irregular, brownish patches, with an orange colored border.

207. SEPTOCYLINDRIUM Bon.

625. *Septocylindrium bonordenii* Sacc. (*Cylindrium septatum* Bon.), Lincoln. P.

51. DEMATIEÆ.

208. TORULA Pers.

626. *Torula herbarum* Link. On stems of pumpkin, Lincoln. P.

209. STREPTOTHRIX Corda.

627. *Streptothrix atra* B. & C. On oak bark, Saltillo. P.

210. ZYGODESMUS Corda.

628. *Zygodesmus pannosus* B. & C. On decaying wood, Lincoln. P.

211. ACREMONIELLA Sacc.

629. *Acremoniella atra* (Corda) Sacc. On decaying stems of grass. Rare. Lincoln. P.

212. ELLISIELLA Sacc.

630. *Ellisiella caudata* (Peck.) Sacc. On stems of bushy blue stem *Andropogon nutans*), Lincoln. P.

213. MYXOTRICHUM Kunze.

631. *Myxotrichum deflexum* Berk. On nut shell, Lincoln. P.

214. FUSICLADIUM Bonord.

632. *Fusicladium dendriticum* (Wallr.) Fuckel. Apple speck. On leaves and fruit of apple (*Pyrus malus*), Lincoln. Very common. It is the little black speck of the apple rind.

215. SCOLECOTRICHUM Kunze & Schm.

633. *Scholecotrichum maculicola* Ell. & Kell. On leaves of reed grass (*Phragmites communis*), Howard county.

216. POLYTHRINCIUM Kunze & Schm.

634. *Polythrincium trifolii* Kunze. On white clover (*Trifolium repens*), Lincoln. P.

217. CLADOSPORIUM Link.

635. *Cladosporium epimyces* Cke. On *Agaricus*, Lincoln.

636. *Cladosporium graminum* Corda. On decaying grass, Lincoln. P.

637. *Cladosporium herbarum* (Pers.) Link. On various decaying stems, leaves, etc., Lincoln; Peru; Nebraska City.

638. *Cladosporium papyricolum* B. & Br. On paste board, Lincoln.

639. *Cladosporium triostei* Peck. On horse gentian (*Triosteum perfoliatum* L.), Lincoln. P.

218. CLASTEROSPORIUM Schw.

640. *Clasterosporium macluræ* (Thuemen) Pound. (*Sporodesmium macluræ* Thuem., Myc. Univ. 2074.) On leaves of Osage orange (*Maclura aurantiaca*), Lincoln. Not common. ("Seems to have been omitted by Saccardo. I think it is a *Clasterosporium*. Thuemen says, '*Sporodesmium scirpiola* valde proximum.' Saccardo places the latter in *Clasterosporium*." Pound.)

219. HELMINTHOSPORIUM Link.

641. *Helminthosporium macrocarpum* Grev. On ash limbs, Lincoln. P.

642. *Helminthosporium septemseptatum* Peck. On decaying grass and wood, Lincoln. P.

220. CERCOSPORA Fries.

643. *Cercospora acalyphæ* Peck. On three-seeded mercury (*Acalypha virginica*), Lincoln.

644. *Cercospora acetosellæ* Ell. On field or sheep-sorrel (*Rumex acetosella*), Lincoln. P.

645. *Cercospora alismatis* Ell. & Holw. On water plantain (*Alisma plantago*), Weeping Water. P.

646. *Cercospora ampelopsidis* Peck. On Virginia creeper (*Parthenocissus quinquefolia*), Lincoln. P.

647. *Cercospora avicularis* Wint. On knotweed or knotgrass (*Polygonum erectum*), Lincoln. P.

648. *Cercospora beticola* Sacc. On leaves of beet, Lincoln. P.

649. *Cercospora brachiata* Ell. & Ev. On amaranth or pig-weed (*Amarantus retroflexus*), Lincoln. P.

650. *Cercospora catalpæ* Wint. On leaves of *Catalpa*, Lincoln. P.

651. *Cercospora ceanothi* Kell. & Sw. On red-root or shoe-string (*Ceanothus ovatus*), Weeping Water. P.

652. *Cercospora circumscissa* Sacc. On leaves of cherry (*Prunus virginiana*), Lincoln. P.

653. *Cercospora clavata* (Ger.) Peck. On common milkweed (*Asclepias syriaca*), Lincoln.

654. *Cercospora depazeoides* (Desm.) Sacc. On leaves of common elderberry (*Sambucus canadensis*), Lincoln. P.

655. *Cercospora desmanthi* Ell. & Kell. On desmanthus (*Desmanthus brachylobus*), Lincoln. P.

656. *Cercospora diospyri* Thuem. On leaves of persimmon (*Diospyros virginiana*), Lincoln.

657. *Cercospora euonymi* Ell. On leaves of burning bush or Waahoo (*Euonymus americanus*), Weeping Water. P.

658. *Cercospora eupatorii* Peck. On white snakeroot (*Eupatorium ageratoides*), Lincoln. P.

659. *Cercospora ferruginea* Fuckel. On great ragweed (*Ambrosia trifida*), Lincoln. Common.

660. *Cercospora galii* Ell. & Holw. On wild liquorice or bedstraw (*Galium circæzans*), Lincoln. P.

661. *Cercospora glandulosa* Ell. & Kell. On tree of heaven (*Ailanthus glandulosus*), Lincoln. P.

662. *Cercospora gossypina* Cke. On leaves of cotton cultivated near Lincoln.

663. *Cercospora granuliformis* Ell. & Holw. On common blue violet (*Viola palmata* var. *cucullata*), Lincoln.

664. *Cercospora hydropiperis* (Thuem) Speg. On smartweed (*Polygonum pennsylvanicum*), Lincoln. P.

665. *Cercospora isanthi* Ell. & Kell. On false pennyroyal (*Isanthus cæruleus*), Cass county.

666. *Cercospora lini* Ell. & Ev. On wild flax (*Linum sulcatum*), Lincoln. P.

667. *Cercospora liriodendri* Ell. & Harkn. On tulip tree (*Liriodendron tulipifera*), Lincoln. P.

668. *Cercospora microsora* Sacc. On leaves of basswood (*Tilia* sp.), Lincoln. P.

669. *Cercospora monoica* Ell. & Holw. On leaves of hog peanut or ground nut (*Amphicarpæa monoica*), Crete.

670. *Cercospora murina* Ell. & Kell. On blue violet (*Viola palmata* var. *cucullata*), Lincoln; yellow violet (*Viola pubescens*), Lincoln. P.

671. *Cercospora negundinis* Ell. & Ev. (n. sp. in lit.) On leaves of box-elder (*Negundo aceroides*), Lincoln. P.

672. *Cercospora oxybaphi* Ell. & Halst. On *Oxybaphus nyctagineus*, Lincoln. P.

673. *Cercospora passaloroides* Wint. On lead plant (*Amorpha canescens*), Lincoln.

674. *Cercospora pentstemonis* Ell. & Kell. On pentstemon (*Pentstemon grandiflorus* and *P. glaber*), Lincoln.

675. *Cercospora physalidis* Ell. On ground cherry (*Physalis lanceolata*), Lincoln. P.

676. *Cercospora physalidis* Ell. var. *concentrica* Ell. & Ev. (n. var. N. A. F. 2299.) On ground cherry (*Physalis lanceolata*), Lincoln.

677. *Cercospora plantagnis* Sacc. On common plantain (*Plantago major*), Lincoln. P.

678. *Cercospora pulvinulata* Sacc. & Wint. On mulberry (*Morus* sp.), Lincoln. P.

679. *Cercospora rhamni* Fuckel. On buckthorn (*Rhamnus lanceolatus*), Weeping Water. P.

680. *Cercospora rhoina* Cke. & Ell. On sumach (*Rhus glaber*), Lincoln (P.); dwarf sumach (*Rhus copallina*), Richardson county, August.

681. *Cercospora rosicola* Pass. On rose (*Rosa arkansana*), Lincoln.

682. *Cercospora rubi* Sacc. On raspberry (*Rubus* sp.), Lincoln. P.

683. *Cercospora scutellariæ* Ell. & Ev. On skull cap (*Scutellaria parvula*), Lincoln. P.

684. *Cercospora sedoides* Ell. & Ev. On ditch stone crop (*Penthorum sedoides*), Lincoln. P.

685. *Cercospora seminalis* Ell. & Ev. On ovaries of buffalo grass (*Buchloe dactyloides*), Indianola. (Dr. Bessey.)

686. *Cercospora silphii* Ell. & Ev. On rosin weed (*Silphium integrifolium*), Lincoln. P.

687. *Cercospora smilacina* Sacc. On leaves of greenbrier (*Smilax hispida*), Lincoln. P. Very common.

688. *Cercospora sorghi* Ell. & Ev. On Johnson grass (*Andropogon sorghum* var. *halapensis*), Hitchcock and Furnas counties.

689. *Cercospora squalidula* Peck. On leaves of clematis (*Clematis ligusticifolia*), Belmont, Dawes county, July 18. Very common.

690. *Cercospora teucrii* Ell. & Kell. On germander (*Teucrium canadensis*), Lincoln.

691. *Cercospora venturioides* Peck. On milkweed (*Asclepias syriaca*), Lincoln. P.

692. *Cercospora violæ* Sacc. On blue violet (*Viola palmata* var. *cucullata*), Lincoln.

693. *Cercospora viticola* Sacc. On cultivated grape (*Vitis* sp.), Lincoln. P.

221. HETEROSPORIUM Klotzsch.

694. *Heterosporium fungicolum* Ell. & Ev., Jour. of Myc., V, p. 10. On *Polyporus* and *Agaricus*, Lincoln. P.

222. NAPICLADIUM Thuem.

695. *Napicladium arundinaceum* (Corda) Sacc. Forming a black powder on the lower surface of the leaves of reed grass (*Phragmites communis*), Thedford, Thomas county, July 11, 1889.

223. DENDRYPHIUM Wallr.

696. *Dendryphium crustaceum* Ell. & Ev. (n. sp. in lit.) On decaying wood, Milford, October, 1888, with *Sphæria incrustans* E. & E. (n. sp. in lit.) (Hyphæ slightly branched, septate, nodulose, fuscous, 35–140 by 6–12 micromillimetres; conidia darker than the hyphæ, oblong, 3–5 septate, thick walled, 48–60 by 10–16 micromillimetres.)

224. CONIOTHECIUM Corda.

697. *Coniothecium toruloides* Corda. On bark of willow (*Salix* sp.), Brownville.

225. MACROSPORIUM Fr.

698. *Macrosporium chartarum* Peck. On paste-board, Lincoln. P.

699. *Macrosporium cladosporioides* Desm. On carpet paper. Lincoln.

700. *Macrosporium commune* Rabh. On decaying leaves and stems, Lincoln. Very common.

701. *Macrosporium compactum* Cke. On castor-oil plant (*Ricinus* sp.), Lincoln (P.). Apparently the same on gentian, Lincoln.

702. *Macrosporium hibiscinum* Thuem. On dead stems of rose mallow (*Hibiscus esculentus*), Lincoln. P.

703. *Macrosporium pinguedinis* Berk. On decaying grass, Lincoln.

704. *Macrosporium solani* E. & M. On leaves of Stramonium (*Datura stramonium*), Richardson county, August 26. Very common. On under surface of eroded brownish spots that have a more or less concentric banded appearance.

705. *Macrosporium sarcinula* Berk. On fruit of wild pumpkin (*Cucurbita fœtidissima*), Lincoln. P. (Specimen brought from western Nebraska.)

706. *Macrosporium tomato* Cke. var. *cucurbitæ* Ell. & Ev. (n. var. in lit.) On gourd, Lincoln, November, 1889. Forming conspicuous black powdery spots.

52. STILBEÆ.

226. STILBUM Tode.

707. *Stilbum vulgare* Tode. On decaying wood, Lincoln. P.

227. CERATIUM Alb. & Schw.

708. *Ceratium hydnoides* (Jacq.) Alb. & Schw. On decaying wood, Belmont, Dawes county, July. ["Considered by DeBary and Schroeter to be a Myxomycete." B.]

228. PODOSPORIUM Schw.

709. *Podosporium rigidum* Schw. On ground cherry (*Physalis* sp.) and grape stems, Lincoln.

229. ISARIOPSIS Fr.

710. *Isariopsis clavispora* (B. & C.) Sacc. On cultivated grapes (*Vitis*), Lincoln. P.

53. TUBERCULARIEÆ.

230. TUBERCULARIA Tode.

711. *Tubercularia vulgaris* Tode. On dead limbs, Lincoln. P.

231. DENDRODOCHIUM Bon.

712. *Dendrodochium macrosporum* Sacc. & Ell. var. *aphanistophus* Ell. & Ev. On dead stems of weed, probably *Helianthus*, Lincoln. Spores 4–5 by 12–15 micromillimetres.

232. TUBERCULINA Sacc.

713. *Tuberculina persicina* (Ditm.) Sacc. In cups of the rust *Æcidium compositarum* var. *lygodesmæ*, Belmont, Dawes county, July 20. Very destructive, its smooth violet colored spores filling up fully half of the pseudo-peridia and injuring many more, destroying and taking the place of the æcidiospores.

233. ILLOSPORIUM Mart.

714. *Illosporium roseum* (Schreb.) Mart. On lichen (*Physcia stellaris*), Lincoln; Belmont.

234. FUSARIUM Link.

715. *Fusarium graminium* Corda. On corn stems, Lincoln. Apparently the same on buffalo grass (*Buchloe dactyloides*), Lincoln. P.

716. *Fusarium incarnatum* (Desm.) Sacc. On germinating barley in laboratory, Lincoln. P.

717. *Fusarium lateritium* Nees. On decaying wood, Lincoln.

718. *Fusarium oxysporium* Schlecht. f. *aurantiacum* Corda. On squash, Lincoln.

719. *Fusarium roseum* Link. On rose mallow (*Hibiscus triorum*); milkweed (*Asclepias syriaca*); pigweed (*Amarantus retroflexus*); corn (*Zea mays*), and various grasses, Lincoln.

CLASS IV.—BASIDIOMYCETES.

Order Gasteromycetes. The Puff-balls.

54. PHALLOIDEÆ. STINK-HORN FUNGI.

235. DICTYOPHORA Desvaux.

720. *Dictyophora duplicata* (Bosc.) Ed. Fisch. On ground. Rare. One specimen preserved in alcohol in University herbarium.

236. ITHYPHALLUS Fries.

721. *Ithyphallus impudicus* (L.) Fries. Common stink-horn fungus. On ground, Lincoln. Common.

722. *Ithyphallus impudicus* (L.) Fries. var. *imperialis* (Schulz) Ed. Fisch. With

reddish or pinkish volva. On ground in grass, Lincoln; Beatrice. Common.

237. MUTINUS Fries.

723. *Mutinus caninus* (Huds.) Fries. On ground in sand hills, Broken Bow, July 4. A specimen sent from Valentine by Rev. Bates I consider to be this species also.

238. SIMBLUM Klotzsch.

724. *Simblum rubescens* Gerard. Quite common in grass and open weedy places. I collected twenty-five specimens at one time on open stubble ground. The abnormal, two-stemmed form I have found several times. Lincoln.

55. NIDULARIACEÆ.

239. CYATHUS Hall.

725. *Cyathus vernicosus* (Bull.) DC. On old decaying logs, etc., Lincoln.

240. CRUCIBULUM Tul.

726. *Crucibulum vulgare* Tul. On decaying wood, common, Lincoln; Weeping Water.

241. SPHÆROBOLUS Tode.

727. *Sphærobolus stellatus* Tode. On pine sidewalk, Lincoln.

56. LYCOPERDIACEÆ.

242. SECOTIUM Kunze.

728. *Secotium warnei* Peck. On ground, very common, Lincoln; Dismal river, Thomas county, July 12. Two forms occur quite commonly: (*a*), columnar umbonate; (*b*), depressed globose.

243. TYLOSTOMA Pers. Stalked puff-balls.

729. *Tylostoma fimbriatum* Fr. On ground, quite common, Lincoln.

730. *Tylostoma mammosum* (Mich.) Fr. On ground. Not common. Lincoln; Belmont, July 25. My specimens from Lincoln are considerably larger than the type. They have the definite mouth of *T. mammosum*, but the peridium is depressed globose in shape.

731. *Tylostoma meyenianum* Kl. In grass on prairies, sandy soil. Dismal river, Thomas county, July 12; Belmont, Dawes county, July 21.

731½. *Tylostoma campestre* Morg. In grass with *T. fimbriatum* Fr. Lincoln.

244. GEASTER Mich. Earth stars.

732. *Geaster campester* Morg. In grass, weeds, and barren spots, very common. Lincoln.

733. *Geaster delicatus* Morg. In grass and in open, barren, clayey soil destitute of weeds. Lincoln.

733½. *Geaster limbatus* Fr. At base of stumps, Lincoln, April 26, 1890. (Presented by Mr. Shimek, of the State University.)

734. *Geaster vittatus* Kalchbr. On ground, Waverly.

245. BOVISTA Dill.

735. *Bovista circumscissa* Berk. & Curt. On ground in grass, very common. Lincoln; Dismal river, Thomas county; Belmont, Dawes county.

736. *Bovista minor* Morgan (n. sp. in lit.) On ground in woods, rare. Lincoln. A small species, inner peridium papyraceus, black or darkish brown, shiny.

246. LYCOPERDON Tourn. Puff-balls.

737. *Lycoperdon atro-purpureum* Vitt. On ground in grass, Lincoln.

738. *Lycoperdon atro-purpureum* Vitt. var. *stellare* Peck. On ground, Lincoln.

739. *Lycoperdon bovista* L. (*L. giganteum* Batsch.) On ground, common. Lincoln; Greenwood.

740. *Lycoperdon cyathiforme* Bosc. On ground in pastures and yards, Lincoln.

741. *Lycoperdon fragile* Vitt. In grass on prairies, quite common in the western part of the state. Lincoln; Belmont, Dawes county, July 25; Dismal river, Sioux county, August 2.

742. *Lycoperdon frostii* Peck. On ground in woods, rare. Weeping Water. A beautiful species with long spines.

743. *Lycoperdon gemmatum* Batsch. On rotting wood, common. Waverly; Lincoln; Wymore; Peru.

744. *Lycoperdon lepidophorum* Ell. & Ev. On ground, Lincoln. Rare. I have found but one specimen and that rather old, but Morgan thinks it this species.

745. *Lycoperdon piriforme* Schæff. On ground near stumps, etc., common. Lincoln; Milford; Peru.

746. *Lycoperdon wrightii* Berk. & Curt. On ground, common. Lincoln; Peru; Thedford.

247. SCLERODERMA Pers.

747. *Scleroderma corium* (Guers.) Grav. (*Mycenastrum corium* Desv.) On ground, common. Lincoln.

748. *Scleroderma olivaceum* Cke. & Massee. In grass, Lincon.

Order Hymenomycetes.

57. AGARICINEÆ. TOADSTOOLS.

248. LEPIOTA Fr.

749. *Lepiota procera* Scop. On ground, rare. Lincoln.

749½. *Lepiota morgani* Peck. In grass, rare. Lincoln.

249. TRICHOLOMA Fr.

750. *Tricholoma flavidum* Peck. On ground, Lincoln.

751. *Tricholoma cerinum* Pers. At base of old stumps, Lincoln.

752. *Tricholoma spermaticum* Fr. On tree trunks, etc., Lincoln.

753. *Tricholoma sulphureum.* On ground, Lincoln.

250. PLEUROTUS Fr.

754. *Pleurotus sapidus* Kalchbr. On ground, Lincoln. Bessey.

755. *Pleurotus ostreatus* Jacq. On old decaying logs, railroad ties, etc., Lincoln.

251. LENTINUS Fr.

756. *Lentinus sulcatus* Berk. On trunks of trees, rare. Milford.

757. *Lentinus tigrinus* (Bull.) Fr. On old logs, etc., common. Lincoln.

252. PANUS Fr.

758. *Panus conchatus* Fr. On decaying wood, Lincoln; Weeping Water.

759. *Panus farinaceus* Schum. On old logs, rare. Lincoln.

760. *Panus stipticus* (Bull.) Fr. On old wood, etc., Lincoln; Peru. Quite common.

253. LENZITES Fr.

761. *Lenzites betulina* (L.) Fr. On decaying limbs, common. Lincoln; Peru.

762. *Lenzites sepiaria* Fr. On old logs, common. Lincoln

763. *Lenzites vialis* Peck. On old logs, etc., rare. Peru.

254. SCHIZOPHYLLUM Fr.

764. *Schizophyllum commune* Fr. On bark of trees, very common. Lincoln; Peru; Omaha; Nebraska City; Weeping Water.

255. PHOLIOTA Fr.

765. *Pholiota dura* Bolton. On ground, rare. Wymore.

256. INOCYBE Fr.

766. *Inocybe flocculosa* Berk. In grass on ground, Lincoln.

257. PAXILLUS Fr.

767. *Paxillus porosus* Berk. On ground in deep woods, not uncommon, Lincoln.

258. AGARICUS L.

768. *Agaricus campester* L. Edible mushroom. On ground, very common, Lincoln.

769. *Agaricus pratensis* Schæff. On ground, rare, Ashland. U.

259. HYPHOLOMA Fr.

770. *Hypholoma hydrophilum* Bull. On ground Lincoln.

260. PSILOCYBE Fr.

771. *Psilocybe spadicea* Fr. On ground, Weeping Water.

261. COPRINUS Pers. Ink toadstool.

772. *Coprinus micaceus* (Bull.) Fr. On ground, Lincoln.

773. *Coprinus radiatus* (Bolt.) Fr. In flower pot in laboratory, Lincoln.

774. *Coprinus variegatus* Peck. On ground, Lincoln.

262. PANÆOLUS Fr.

775. *Panæolus solidipes* Peck. On ground, Lincoln.

58. POLYPOREÆ. BRACKET FUNGI.

263. GYRODON Opatowski.

776. *Gyrodon sistotrema* Fr. (*Boletus sistotrema* Fr.) On ground, rare, Lincoln.

264. POLYPORUS Michx.

777. *Polyporus adustus* (Willd.) Fr. On old decaying wood, logs, etc., Lincoln; Peru; Weeping Water.

778. *Polyporus arcularius* (Batsch.) Fr. On ground, common, Lincoln; Hastings; Nebraska City.

779. *Polyporus crispus* (Pers.) Fr. On decaying wood, Lincoln.

780. *Polyporus elegans* (Bull.) Fr. var. *numularius* Fr. On decaying logs, Lincoln.

781. *Polyporus fumosus* (Pers.) Fr. On old trees, Lincoln.

782. *Polyporus gilvus* Schw. On decaying logs, very common, Lincoln; Wymore; Peru; Omaha; Weeping Water; Nebraska City; Dismal river, Thomas county; Belmont, Dawes county.

783. *Polyporus lacteus* Fr. On old logs, Plattsmouth; Lincoln.

784. *Polyporus picipes* Fr. On ground and decaying logs, common, Lincoln; Belmont, Dawes county, July 18.

785. *Polyporus resinosus* (Schrad.) Fr. On old trees, Brownville.

786. *Polyporus sulphureus* (Bull.) Fr. On decaying wood, Lincoln.

265. FOMES Fr.

787. *Fomes applanatus* (Pers.) Wallr. On decaying wood, Lincoln.

788. *Fomes fomentarius* (L.) Fr. On old logs, Lincoln.

789. *Fomes fraxinophilus* Pk. On old logs. Common in the western part of the state. Dismal river, Thomas county, July 13; Anselmo, July 6.

790. *Fomes ignarius* (L.) Fr. On bark of trees, Lincoln.

791. *Fomes pinicola* Fr. On pine logs. Not uncommon in the northwestern part of the state. Belmont, July 25, 1889. Above brownish, waxy, especially on new growth.

792. *Fomes salicinus* (Pers.) Fr. On decaying trees, Lincoln.

793. *Fomes volvatus* Peck. On decaying trunks of pine. Rare in Nebraska. Belmont, July 24. A very beautiful species.

266. POLYSTICTUS Fr.

794. *Polystictus abietinus* Fr. On decaying pine logs. Rare. Belmont, July 22.

795. *Polystictus conchifer* Schw. On old logs, common. Lincoln.

796. *Polysticus hirsutus* Fr. On old logs, tree trunks, etc., Lincoln; Belmont; Peru; Weeping Water; Anselmo.

797. *Polystictus laceratus* Berk. On decaying trunks and limbs, York; Lincoln.

798. *Polystictus sanguineus* (L.) Mey. On trunks of trees, Milford; Nebraska City; Lincoln; Richardson county; Plattsmouth. A beautiful scarlet-red species. Quite common.

799. *Polystictus versicolor* (L.) Fr. On old stumps. Our most common species. Lincoln; Wymore; Weeping Water; Peru; Omaha; Tecumseh; Anselmo; Thedford; Belmont.

267. PORIA Pers.

800. *Poria obducens* Pers. On decaying wood, Lincoln.

268. TRAMETES Fr.

801. *Trametespeckii* Kalchbr. On old limbs and trunks of various kinds, especially cottonwood and willow, common. Lincoln.

269. DÆDALEA Pers.

802. *Dædalea confragosa* Pers. On decaying wood and bark of trees, common. Peru; Lincoln; Milford.

803. *Dædalea quercina* (L.) Pers. On old red cedar logs; Dismal river, Thomas county, July 13; Anselmo, Custer county, July 6.

804. *Dædalea unicolor* (Bull.) Fr.

270. MYRIADOPORUS Peck.

805. *Myriadoporus adustus* Peck. On decaying wood, Milford; Plattsmouth.

271. FAVOLUS Fr.

806. *Favolus europæus* Fr. On bark of trees, Lincoln; Peru.

272. GLŒOPORUS Mont.

807. *Glœoporus conchoides* Mont. On dead limbs, etc., common. Peru.

273. MERULIUS Hall.

808. *Merulius ambiguus* Berk (*M. fugax* Rav.) On bark of decaying pine logs, common. Belmont, July 25. All of my Nebraska specimens seem to grow from old worm holes in the wood, which in mature specimens is near the centre of the more or less circular hymenium, remaining as a small peculiar appearing central hole. I notice that

this is true also of the specimens distributed by Ellis & Everhart (N. A. F. No. 925).

809. ***Merulius lachrymans*** (Jacq.) Fr. On rotten wood in shaded places, cellars, etc., common. Lincoln.

810. ***Merulius tremellosus*** Schrad. On ground under old floor, Lincoln.

274. SOLENIA Hoffm.

811. *Solenia ochracea* Hoffm. On stems of Waahoo or Burning Bush (*Euonymus atropurpureus*), Peru.

59. HYDNEÆ.

275. HYDNUM L.

812. *Hydnum coralloides* Scop. On rotten wood, rare. Lincoln.

813. *Hydnum ochraceum* Pers. On old stumps, common. Lincoln.

276. IRPEX Fr.

814. *Irpex sinuosus* Fr. On dead limbs, Lincoln; Milford.

277. GRANDINIA Fr.

815. *Grandinia crustosa* (Pers.) Fr. On decaying wood, Lincoln.

816. *Grandinia hydnoides* Ell. & Ev. (n. sp. in lit.) On bark of box-elder (*Negundo aceroides*), Lincoln.

60. THELEPHOREÆ.

278. THELEPHORA Ehr.

817. *Thelephora willeyi* Clinton. On ground in woods, Lincoln.

279. STEREUM Pers.

818. *Stereum curtisii* Berk. On bark of limbs, Peru.

819. *Stereum frustulosum* (Pers.) Fr. On decaying logs, common. Lincoln; Milford.

820. *Stereum hirsutum* (Willd.) Fr. On old stump, Plattsmouth.

821. *Stereum ochroleucum* Fr. On bark of living trees, Milford; Peru; Lincoln.

822. *Stereum versicolor* (Schw.) Fr. On decaying wood, Peru; Weeping Water; Lincoln.

280. HYMENOCHÆTE Lev.

823. *Hymenochæte cervina* Berk. & Curt. On old wood, Lincoln.

824. *Hymenochæte corrugata* (Fr.) Lev. On decaying limbs, Lincoln.

825. *Hymenochæte rubiginosa* (Schr.) Lev. On old stumps, Milford; Lincoln.

281. CORTICIUM Fr.

826. *Corticium incarnatum* (Pers.) Fr. On decaying wood, Lincoln.

827. *Corticium leve ?* Pers. On bark of oak, Peru.

282. PENIOPHORA Cke.

828. *Peniophora occidentalis* Ell. & Ev. On decaying branches, Brownville.

283. CYPHELLA Fr.

829. *Cyphella pezizoides* Zopf. (*Peziza campanula* Ellis, in Torr. Bull., vol. VIII, p. 73.) On stems of basswood (*Tilia americana*), Peru.

61. CLAVARIEÆ.

284. CLAVARIA Vaill.

830. *Clavaria crispula* Fr. On decaying wood, Lincoln.

62. TREMELLINEÆ.

285. HIRNEOLA Fr.

831. *Hirneola auricula-judæ* (L.) Berk. On bark of living trees, especially

bur oak, Weeping Water; Lincoln; Peru; Nebraska City. A common and conspicuous species.

286. TREMELLA Dill.

832. *Tremella frondosa* Fr. On decaying wood, common. Lincoln ; Peru.

CLASS V.—CHARACEÆ. THE STONEWORTS.

63. CHAREÆ.

287. CHARA (Vaill.) Leonh.

833. *Chara coronata* A. Br. Very common in the ponds of central and western Nebraska. Thedford, July 10; Belmont; Ft. Robinson, July 29.

834. *Chara* sp. In ponds usually with the preceding. Thedford; Belmont.

63½. NITELLEÆ.

287½. NITELLA Ag.

834½. *Nitella opaca* Ag. In small, stagnant pond, Lincoln, May 5, 1890. A medium sized diœcious species found in considerable quantity by Mr. Shimek, of the State University.

BRYOPHYTA.

CLASS I.—HEPATICÆ.

64. RICCIACEÆ.

288. RICCIA Mich.

835. *Riccia fluitans* L. Common in rather stagnant ponds. Fremont; Thedford, Thomas county, July 11.

836. *Riccia glauca* L. On ground, Lincoln.

837. *Riccia lescuriana ?* Aust. High field, Lincoln. (Smith.)

65. MARCHANTIACEÆ.

289. MARCHANTIA L.

838. *Marchantia polymorpha* L. On ground, common. Lincoln; Dismal river, Thomas county, July 13; Belmont, July 24.

290. PREISSIA Nees.

839. *Preissia hemisphærica* (L.) Cogn. (*P. commutata* Nees.) On ground, Plattsmouth.

291. GRIMALDIA Raddi.

840. *Grimaldia barbifrons* Bisch. Damp places on ground, Waverly.

292. ASTERELLA Beauv.

841. *Asterella hemisphærica* Beauv. On ground, South Bend, September.

293. CONOCEPHALUS Neck.

842. *Conocephalus conicus* (L.) Dumort. Damp shaded banks, forming large mats, common. Dismal river, Thomas county, July 13.

294. FIMBRIARIA Nees.

843. *Fimbriaria tenella* Nees. On ground, South Bend, September.

66. ANTHOCEROTACEÆ.

295. ANTHOCEROS L.

844. *Anthoceros punctatus* L. On ground, South Bend, September.

67. JUNGERMANIACEÆ.

296. **FRULLANIA** Raddi.

845. *Frullania eboricensis* Gottsche. On trees, Plattsmouth. (Bessey.)

297. **MADOTHECA** Dumort.

846. *Madotheca platyphylla* (L.) Dumort. (*Porella platyphylla* Lind.) On ground, Weeping Water.

298. **LOPHOCOLEA** Nees.

847. *Lophocolea heterophylla* (Schrad.) Nees. On old logs, Belmont, July 21; South Bend, September.

299. **PALLAVICINIA** S. F. Gray.

848. *Pallavicinia hibernica* (Hook.) S. F. Gray. On ground, Belmont, July 25; Dismal river, Thomas county, July 13, 1889. (Dr. Underwood says: "I cannot distinguish this from *Pallavicinia hibernica*. It has also been sent by Prof. Macoun, from northwestern America. It is new to the country.")

849. *Pallavicinia lyellii* (Lehm.) S. F. Gray. On ground in canons, Belmont, July 21; Dismal river, Thomas county, July 13.

CLASS II.—MUSCI.

68. BRYACEÆ.

300. **CERATODON** Brid.

850. *Ceratodon purpureus* (L.) Brid. On ground, Lincoln.

301. **DIDYMODON** Hedw.

851. *Didymodon cylindricus* Bruch & Schimp. On ground, Belmont, Dawes county, July 24. Nicely in fruit. (Described as rarely fertile.)

302. **BARBULA** Hedwig.

852. *Barbula unguiculata* Hedw. On rocks, Brownville, January 2.

303. **COSCINODON** Sprengel.

853. *Coscinodon wrightii* Sulliv. On rocks, etc.; common in western part of the state. Culbertson; Belmont; Sioux county.

304. **ORTHOTRICHUM** Hedw.

854. *Orthotrichum strangulatum* Beauv. On trees and rocks, Weeping Water; Lincoln; Sioux county. Very common.

305. **PHYSCOMITRIUM** Brid.

855. *Physcomitrium acuminatum* Bruch & Schimp. On low, wet ground, common. Lincoln, May.

856. *Physcomitrium pyriforme* (Hedw.) Brid. On ground, etc., Lincoln; Nebraska City.

306. **FUNARIA** Schreb.

857. *Funaria hygrometrica* (L.) Sibth. On ground, Lincoln, April and May; Plattsmouth.

858. *Funaria hygrometrica* (L.) Sibth. var. *patula* Bruch & Schimp. On ground, common. Thedford, July 14; Belmont, July 24.

307. **LEPTOBRYUM** Schimp.

859. *Leptobryum pyriforme* (L.) Schimp. On wet banks, Belmont, July 24.

308. **WEBERA** Hedw.

860. *Webera acuminata* (Hoppe. & Hornsch.) Schimp. On ground, Thedford, August 1.

861. *Webera nutans* (Schreb.) Hedw. On decaying logs, Hat Creek basin, Sioux county, August 1.

309. BRYUM Dill.

862. *Bryum argenteum* L. var. *lanatum* (Brid.) Bruch & Schimp. On sandstone, Lincoln, August 26. Plentiful, but seldom fruiting.

863. *Bryum pendulum* Schimp. Dismal river, Thomas county, July 12.

864. *Bryum roseum* Schreb. Damp, shaded places on ground, Weeping Water, May 22.

310. MNIUM L.

865. *Mnium cuspidatum* Hedw. On shaded ground, very common. Lincoln; Weeping Water; Wymore; Peru.

311. TIMMIA Hedw.

866. *Timmia austriaca* Hedw. On damp ground, Belmont, July 21.

867. *Timmia megapolitana* Hedw. On ground, Lincoln; Weeping Water.

312. ATRICHUM Beauv.

868. *Atrichum undulatum* (L.) Beauv. On damp, shaded ground, Lincoln.

312½. NECKERA Hedw.

868½. *Neckera pennata* Hedw. On cedar trees, Chadron.

313. LESKEA Hedw.

869. *Leskea polycarpa* Ehrh. On ground, Lincoln; Weeping Water.

314. ANOMODON Hook. & Tayl.

870. *Anomodon obtusifolius* Bruch & Schimp. On trunks of trees, Weeping Water.

315. PYLAISIA Bruch & Schimp.

871. *Pylaisia intricata* (Hedw.) Bruch & Schimp. On trunks of trees, Lincoln, May 2.

316. CYLINDROTHECIUM Bruch & Schimp.

872. *Cylindrothecium compressum* (Hedw.) Bruch & Schimp. At base of trees, Lincoln, April 22. Common. (Barnes says of this: "It is so distinct in appearance that it almost deserves a varietal name. The branches have the leaves so compressed as to be complanate or pseudo-distichous. It may yet prove to be a new variety.")

317. HYPNUM Dill.

873. *Hypnum hispidulum* Brid. On ground, Hat Creek basin, Sioux county, August 1.

874. *Hypnum lætum* Brid. On ground, Lincoln, July.

875. *Hypnum orthocladon* Beauv. On ground, Weeping Water, May 22.

876. *Hypnum radicale* (Bruch & Schimp. ?) Beauv. Damp ground, Lincoln, May.

877. *Hypnum riparium* L. Very abundant in stagnant water. Platte river near Fremont. Used in the University for packing.

878. *Hypnum riparium* L. var. *abbreviatum* L. & J. On ground, Lincoln.

879. *Hypnum salebrosum* Hoffm. On ground, Milford, October.

880. *Hypnum serpens* L. On ground, common. Lincoln, June.

PTERIDOPHYTA.

CLASS I.—EQUISETINÆ.

69. EQUISETACEÆ.

318. EQUISETUM L. Horsetail; scouring-rush.

881. *Equisetum arvense* L. Common horsetail. Wet grounds, banks of streams, etc., common. Wymore; Lincoln; Milford; Long Pine; Weeping Water; Brownville; Anselmo; Hat Creek basin.

882. *Equisetum lævigatum* Braun. Common in low fields, pastures, etc. Lincoln; Weeping Water; Long Pine; Crete.

883. *Equisetum variegatum* Schleicher. Wet places. Long Pine (B.); Lincoln.

884. *Equisetum robustum* Braun. River banks, common. Lincoln; Brownville.

CLASS II.—FILICINÆ.

70. FILICES.

319. WOODSIA R. Br.

885. *Woodsia obtusa* Torr. Canons, Long Pine, July. B.

886. *Woodsia oregana* Eaton. Dry, rather open bluffs, not uncommon. Distinguished by its inconspicuous indusium, which is divided into slender beaded hairs (of a single chain of elliptical or oblong cells). (The stems in cross-section are round, with a slight depression on one side, and contain five fibro-vascular bundles, arranged in a semicircle around the side depression. The two intermediate bundles are much smaller than the others.)

320. ONOCLEA L.

887. *Onoclea sensibilis* L. Sensitive fern. On low, wet ground, Long Pine; Antelope county; Kearney; Dismal river, Thomas county, July 12. (In large, rank patches.)

321. CYSTOPTERIS Bernh. Bladder fern.

888. *Cystopteris fragilis* (L.) Sw. Rich, wooded banks, canons, etc., common. Plattsmouth; Lincoln (rare); Long Pine; Peru; Omaha; Weeping Water; Anselmo; Belmont; Dismal river in Thomas county.

322. ASPIDIUM Sw. Shield fern; wood fern.

889. *Aspidium spinulosum* Sw. Dismal river, Thomas county, July 12. On wet, shaded banks, near the water's edge; very rank and abundant. This is the only place it is yet known to occur in Nebraska. Leaves were collected fully 2½ feet high and a foot wide at the base.

890. *Aspidium thelypteris* (L.) Sw. Damp, shaded places; low, wet bottoms among grass; very common. Long Pine (B.); Kearney; Dismal river, July 12; Thedford, July 10; Crawford, July 29.

323. ADIANTUM L. Maidenhair.

891. *Adiantum pedatum* L. In rich woods, Plattsmouth; Peru; Richardson county.

324. PELLÆA.

892. *Pellæa atropurpurea* (L.) Link. Cliff brake. Crevices of rocks, common. Peru; Weeping Water; Brownville.

325. NOTHOLÆNA R. Br.

893. *Notholæna dealbata* Kunze. Growing from crevices in the rocks, Weeping Water.

71. OPHIOGLOSSACEÆ.

326. BOTRYCHIUM Sw. Moonwort.

894. *Botrychium virginianum* (L.) Sw. Damp, wooded bluffs, canons, etc., common. Lincoln; Weeping Water; Belmont.

72. SALVINIACEÆ.

327. AZOLLA Lam.

895. *Azolla caroliniana* Willd. On ground at edge of water, Dismal river, Thomas county, July 13. Rare.

CLASS III.—LYCOPODINEÆ.

73. SELAGINELLEÆ.

328. SELAGINELLA Beauv.

896. *Selaginella rupestris* (L.) Spring. Sand hills, Long Pine; Lincoln county; Cheyenne county. B.

74. ISOETEÆ.

329. ISOETES L. Quillwort.

897. *Isoetes melanopoda* J. Gay. Ditches, etc., very rare. Exeter. (Collected September 8, 1888, by Dr. J. Herman Wibbe.)

ANTHOPHYTA.

CLASS I.—GYMNOSPERMÆ.

75. CONIFERÆ.

330. PINUS Tourn. Pine.

898. *Pinus ponderosa* Dougl. var. *scopulorum* Engelm. Yellow pine. The only native pine in the state. It forms the bulk of the northwestern wood region. On "Pine Ridge" from Sioux county eastward to Rock and Keya Paha counties, and in isolated canons in Custer, Valley and Greeley counties; Belmont; Hat Creek basin; Long Pine; Fort Robinson.

331. JUNIPERUS L. Juniper.

899. *Juniperus communis* L. Common juniper. Not very common. Hat Creek basin, Sioux county; Crawford; Weeping Water.

900. *Juniperus virginiana* L. Red cedar. Common. Anselmo, July 6; Dismal river, Thomas county, July 13; Belmont, July 26; Hat Creek basin, Sioux county, August 2; Long Pine. On high rocky places it is frequently almost prostrate. In other places commonly a a magnificent tree. A section of a trunk from Custer county, in the University cabinet, measures nearly two feet in diameter.

CLASS II.—ANGIOSPERMÆ.

Sub-Class I.—Monocotyledones.

76. NAIADACEÆ. (PONDWEED FAMILY.)

332. ZANNICHELLIA L. Horned pondweed.

901. *Zannichellia palustris* L. Horned pondweed. Common in running streams and ponds. Lincoln, October; Dismal river, Thomas county, July 12. Nutlets pod-like 3–4 millimetres long and 1 wide, beaked by a presistent style about 1 millimetre in length, winged margined, and toothed.

333. RUPPIA L. Ditch grass.

902. *Ruppia maritima* L. Ditch grass. Common in streams and ponds around Lincoln. A form of this with the rather large leaves collected at the summit and conspicuously distichous, resembling a fan with exceedingly long (1–2 feet) spiral peduncle, seems to be the foreign var. *pedunculata* Hartman. It is very plentiful in Grand lake, southwest of Alliance.

334. POTAMOGETON L. Pondweed.

903. *Potamogeton hybridus* Michx. Ponds and sluggish streams, common, Lincoln.

904. *Potamogeton natans* L. Ponds, Lincoln; Geneva.

905. *Potamogeton pauciflorus* Pursh. In ponds, etc., August, Lincoln.

906. *Potamogeton rufescens* Schrad. Cass county. W.

335. TRIGLOCHIN L. Arrow grass.

907. *Triglochin maritimum* L. Arrow grass. Low, wet prairies, rare. Thedford, July 11; Alliance, August 7.

77. ALISMACEÆ. (WATER PLANTAIN FAMILY.)

336. SAGITTARIA L. Arrow head.

908. *Sagittaria graminea* Michx. Arrow head. Edges of ponds, rare. Lincoln, June.

909. *Sagittaria variabilis* Engelm. Common arrow head. Edges of ponds, very common. July. Lincoln; Weeping Water; Antelope county; Anselmo; Thedford; Belmont; Sioux county.

337. ALISMA L. Water plantain.

910. *Alisma plantago* L. var. *triviale* (Pursh.) B. S. P. (var. *americana* Gray). Water plantain. Edges of ponds, wet prairies, etc.; rare. Holmesville, July; Anselmo, July 6.

78. LEMNACEÆ. (DUCKWEED FAMILY.)

338. SPIRODELA Schleid. Duckweed; duck's meat.

911. *Spirodela polyrrhiza* (L.) Schleid. Common duckweed. Floating on ponds and creeks, very common. Lincoln; Weeping Water; Anselmo, July 6; Thedford, July 11; Belmont, July 24.

339. LEMNA L. Duckweed; duck's meat.

912. *Lemna minor* L. Little duckweed. On ponds, not so common as the preceding. Anselmo, July 6; Thedford, July 11; Lincoln.

913. *Lemna trisulca* L. Duckweed. In stagnant ponds, not common. Fremont; Thedford, July 11. What is apparently a very small form of this I have in considerable quantity from Thedford. Collected July 11, sometimes in the same ponds with the normal form. It is quite distinct, being much smaller and of a darker green color. The fronds are oblong-lanceolate from 3–4½ or rarely 5 millimetres long, by from 1–2 millimetres wide.

79. AROIDEÆ. (ARUM FAMILY.)

340. ARISÆMA Martius. Indian turnip; dragon arum.

914. *Arisæma dracontium* Schott. Green dragon or dragon-root. Woods, rare. Weeping Water; Crete.

915. *Arisæma triphyllum* (L.) Torr. Indian turnip, or Jack-in-the-pulpit. Rich woods, common in eastern Nebraska. May. Lincoln; Milford; Weeping Water; Crete.

841. ACORUS L. **Calamus; sweet flag.**

916. *Acorus calamus* L. Calamus or sweet flag. Wet places, rare, probably limited to the extreme eastern part of the state. Nebraska City, June.

80. TYPHACEÆ. (CAT-TAIL FAMILY.)

842. SPARGANIUM L. Bur-reed.

917. *Sparganium eurycarpum* Engelm. Bur-reed. Edges of ponds, common. Lincoln; Peru; Belmont; Anselmo.

843. TYPHA L. Cat-tail flag.

918. *Typha latifolia* L. Common cat-tail. Wet places, common. Lincoln; Weeping Water; Peru; Anselmo; Alliance; Thedford; Belmont.

81. CYPERACEÆ. (SEDGE FAMILY.)

844. CAREX L. Sedge.

919. *Carex cephaloidea* Dewey. Lincoln; Crete; Weeping Water.

920. *Carex crus-corvi* Shuttlew. Edges of ponds, common. Lincoln.

921. *Carex eburnea* Boott. Nebraska. (Gray's Manual, p. 510.)

922. *Carex filiformis* L. Hardy. U.

923. *Carex gravida* Bailey. Lincoln. (Only specimen collected was sent to Prof. Bailey for identification.)

924. *Carex grisea* Wahl. Nebraska. (Hayden. Coulter's Manual.)

925. *Carex hystricina* Muhl. Low prairies, Lincoln; Weeping Water.

926. *Carex jamesii* Torr. var. *nebraskensis* (Dew.) Bailey. Nebraska. (Coulter's Manual, p. 384.)

927. *Carex laxiflora* Lam. Low prairie, Lincoln. Hardy.

928. *Carex longirostris* Torr. Nebraska. (Gray's Manual, p. 603.)

929. *Carex muricata* L. Weeping Water. W.

930. *Carex rosea* Schk. Damp woods, rare. Weeping Water; Lincoln; Nebraska City.

931 *Carex shortiana* Dew. Nebraska City. (Hayden, in Coulter's Manual, p. 379.)

932. *Carex stenophylla* Wahl. Hardy. U.

933. *Carex straminea* Schk. Crete; Lincoln; Hitchcock county.

934. *Carex straminea* Schk. var. *mirabilis* (Dewey) Tuck. (*C. mirabilis* Dewey.) Nebraska. (Coulter's Manual.)

935. *Carex stricta ?* Lam. Lincoln.

936. *Carex tetanica* Schk. var. *meadii* Bailey. Low prairie, Lincoln.

937. *Carex trisperma* Dewey. Weeping Water. W.

938. *Carex tribuloides* Wahl. var. *bebbii* Bailey. Low prairie, Lincoln.

939. *Carex trichocarpa* Muhl. var. *imberis* Gray. Lincoln.

940. *Carex vulpinoidea* Michx. Low places, quite common. Nebraska City; Lincoln; Crete.

845. ERIOPHORUM L. Cotton grass.

941. *Eriophorum virginicum* L. Cotton grass. Nebraska. (Gray's Manual, p. 583.)

846. SCIRPUS L. Bulrush or club-rush.

942. *Scirpus atrovirens* Muhl. Bulrush. Wet places, common. Lincoln; Crete; Weeping Water.

943. *Scirpus atrovirens* Muhl. var. *pallidus* Britton. Hitchcock county.

944. *Scirpus debilis* Pursh. Nebraska. (Gray's Manual, p. 580.)

945. *Scirpus fluviatilis* (Torr.) Gray. Ponds, Lincoln; Weeping Water.

946. *Scirpus lacustris* L. (*S. validus* Vahl.) Ponds, etc., common. Lincoln; Weeping Water; Crete.

947. *Scirpus maritimus* L. Edges of ponds, common. Lincoln; Hardy.

948. *Scirpus pungens* Vahl. Low prairies, Louisville; Anselmo; Broken Bow.

347. ELEOCHARIS R. Brown. Spike-rush.

949. *Eleocharis acicularis* (L.) R. Br. Edges of ponds, common. Lincoln; Louisville; Thedford.

950. *Eleocharis ovata* (Roth.) R. Br. (*E. obtusa* Schult.) Ponds, common. Lincoln.

951. *Eleocharis palustris* (L.) R. Br. Lincoln.

348. CYPERUS L. Galingale.

952. *Cyperus aristulatus* Rottb. (*C. inflexus* Muhl.) Low grounds. Lincoln; Weeping Water.

953. *Cyperus engelmanni* Steud. Louisville. W.

954. *Cyperus esculentus* L. (*C. phymatodes* Muhl.) Banks of creeks, etc., common. Lincoln; Weeping Water.

955. *Cyperus filiculmis* Vahl. Low grounds. Lincoln.

956. *Cyperus schweinitizii* Torr. Louisville; Howard county; Broken Bow; Anselmo; Thedford.

957. *Cyperus speciosus* Vahl. (*C. michauxianus* Schultes.) Lincoln; Hardy.

82. GRAMINEÆ. (GRASS FAMILY.)

349. ELYMUS L. Wild rye; Lyme grass.

958. *Elymus canadensis* L. Common wild rye. Roadsides, everywhere, very common. Lincoln; Crete; Valentine; Fairfield; Hardy; Weeping Water; Geneva; Long Pine; Howard county; Furnas county; Polk county; Valley county; Anselmo; Thedford. A form of this, having the spike partially enclosed in the sheath of the upper leaf, is common at Thedford.

959. *Elymus canadensis* L. var. *glaucifolius* (Muhl.) Gray. Louisville, Cass county.

960. *Elymus condensatus* Presl. Wild rye. Valley county.

961. *Elymus striatus* Willd. Wild rye. In damp woods, shaded canons, etc., Thedford, July 11; Anselmo, July 6; Dismal river, in Thomas county, July 12; Long Pine, July. A slender species, distinguished from *E. sibericus* chiefly by its 1–2 flowered spikelets.

962. *Elymus virginicus* L. Wild rye. Woods and copses along roadsides, very common. Seward; Lincoln; Crete; Weeping Water; Tecumseh; Peru. Distinguished by its enlarged upper sheaths, enclosing the base of the spikes.

350. HORDEUM L. Barley.

963. *Hordeum jubatum* L. Squirrel-tail grass. Prairies, roadsides, waste places, etc., very common. Weeping Water; Hastings; Lincoln; Furnas county; Valley county; Anselmo; Thedford; Crawford. Useful only as an ornamental grass for flower designs and decorations.

964. *Hordeum nodosum* L. Barley grass. Prairie and waste places, common. Lincoln; Hardy; Weeping Water; Furnas county; Thedford. Apparently worthless as an agricultural grass.

351. AGROPYRUM J. Gærtn. Wheat grass.

965. *Agropyrum glaucum* R. & S. Common wheat grass. Prairies through-

out the state, very common. Valentine; Lincoln; Crete; Cambridge; Culbertson; Hardy; Hastings; Howard county; Furnas county; Anselmo; Thedford; Belmont. Perhaps the most valuable of our native grasses. Distinguished by its narrow, quickly attenuated glumes and glaucous, rigid appearance.

966. *Agropyrum repens* (L.) Beauv. Couch, quack, or quitch grass. Low prairies, not uncommon. Valley county; Belmont; Anselmo. Distinguished from the preceding by its larger glumes, with an obtuse or two-notched apex, bearing usually a short awn; and more prominent and numerous veins. The spikelets are closer appressed to the stem and the glumes more nearly surround the flowers than in *Agropyrum glaucum*. This, with the strongly ribbed glumes, gives the head a more compact and striate appearance. Whole plant less rigid.

967. *Agropyrum tenerum* Vasey. Wheat grass. Common in the damp valleys and wooded canons of the northwestern part of the state. Altitude 3800–5000 feet. Belmont, July 18; Crawford, July 29; Hat Creek basin, Sioux county, August 2. Very similar to *A. repens*, from which it is distinguished chiefly by wanting the running root stalk, more fragile narrower leaves, more slender spike, and fewer flowered (3–5) spikelets.

968. *Agropyrum unilaterale* Vasey & Scrib. Wheat grass. Low prairies, not common. Thedford, Thomas county, August 7.

352. LOLIUM L. Darnel.

969. *Lolium* PERENNE L. Common darnel, ray or rye grass. Waste places; escaped. Lincoln.

353. BROMUS L. Brome grass.

970. *Bromus breviaristatus* Thurb. In wooded ravines, rare, probably limited to the western region. Belmont, Dawes county, July 18, 1889.

971. *Bromus ciliatus* L. Hairy brome grass. Usually in shaded places, common. Lincoln; Roca; Peru; Valentine; Weeping Water; Hitchcock county; Belmont; Marsland; Thedford; Dismal river, Thomas county.

972. *Bromus kalmii* Gray. Wild chess. In woods. Belmont, July 18; Thedford, July 15.

973. *Bromus kalmii* Gray var. *porteri* Coulter. In canons, etc., common. Hat Creek basin, August 2.

974. *Bromus* RACEMOSUS L. Upright chess. Fields, rare. Escaped from cultivation. Lincoln.

975. *Bromus* SECALINUS L. Cheat or chess. Roadsides, fields, etc., introduced, becoming common. Lincoln; Hastings.

354. FESTUCA L. Fescue grass.

976. *Festuca* ELATIOR L. Taller or meadow fescue. Lincoln. W.

977. *Festuca nutans* Spreng. Fescue grass. Lincoln; Hardy; Weeping Water.

978. *Festuca ovina* L. Sheep's fescue. Prairies, common. Furnas county; Valley county; Lincoln; Weeping Water.

979. *Festuca scabrella* Torr. Bunch grass. Custer county.

980. *Festuca tenella* Willd. Fescue grass. Prairies, Hitchcock county; Howard county; Thomas county.

355. REDFIELDIA Vasey.

981. *Redfieldia flexuosa* Vasey. Torr. Bull., vol. XIV (1887), p. 133, pl. LXX. Blow-out grass. Very dry, sandy soil, frequently in "blow-outs." Dismal river in Thomas county, July 13, 1887; Valentine,

Cherry county. Easily distinguished by its long leaves; spreading panicle; compressed, 3-5 flowered spikelets, which are hairy at the base and on the short rachilla; three-nerved flowering glumes and bidentate palet, which is folded lengthwise in the middle, and the edges from the two nerves outward sharply infolded, forming two seemingly marginal longitudinal keels.

356. GLYCERIA R. Br. Manna grass.

982. *Glyceria arundinacea* Kunth. Water grass. In edge of water, rare. Thedford, in the Loup river, and Dismal river; both in Thomas county. Rank, from 2-3 feet high, frequently with a panicle fully 16 inches long.

983. *Glyceria distans* (L.) Wahl. Water grass. In damp, shaded canons, rare. Belmont, Dawes county, July 25. A small, slender grass, about 30 centimetres high, with an open panicle and spreading, frequently reflexed rays.

984. *Glyceria nervata* (Willd.) Trin. Fowl-meadow grass or ribbed water grass. Valley county, Anselmo, July 6; Thedford, July 11; Hat Creek basin, August 2; Broken Bow, July 4; Valley county. Flowering glume, strongly 7 nerved, giving the spikelet a beautiful striate appearance.

357. POA L. Meadow grass; spear grass.

985. *Poa andina* Nutt. Mountain spear grass. Wet places, canons, etc., not common. Lancaster county; Chase county; Howard county; Hardy; Weeping Water; Thedford.

986. *Poa* ANNUA L. Goose grass. Introduced. Lincoln. W.

987. *Poa cæsia* ? Smith. Damp canons. Belmont. A very peculiar variety, if indeed it can be considered as belonging here. Dr. Vasey says it may prove to be a new species.

988. *Poa nemoralis* L. In damp canons. Belmont, Dawes county, July 25.

989. *Poa compressa* L. Wire grass. Low prairies, not very common. Lincoln; Weeping Water; Cuming county.

990. *Poa* PRATENSIS L. Kentucky blue grass, June grass, etc. Prairies and waste places, common. Introduced. Lincoln; Crete; Weeping Water; Geneva.

991. *Poa serotina* Ehrh. Fowl-meadow grass. Valley county.

992. *Poa tenuifolia* Nutt. Oregon blue grass. Damp canons, rare. Belmont July 18.

358. DISTICHLIS Raf. Spike grass.

993. *Distichlis spicata* (L.) Greene var. *stricta* Thurber. (*Brizopyrum spicatum* Hook. and *Distichlis maritima* Raf.) Salt grass. Low, and usually alkaline prairies, common. Hitchcock county; Lincoln; Hardy; Alliance; Anselmo.

359. DACTYLIS L. Orchard grass.

994. *Dactylis* GLOMERATA L. Orchard grass. Roadsides and waste places, common. Introduced. Lincoln; Weeping Water; Furnas county.

360. DIARRHENA Raf.

995. *Diarrhena americana* Beauv. Low places, Cass county. Rare.

361. MELICA L.

996. *Melica porteri* Scribner. Woods, rare. Weeping Water, May 21.

362. ERAGROSTIS Beauv.

997. *Eragrostis capillaris* (L.) Nees. Eragrostis. Weeping Water. W.

998. *Eragrostis* MAJOR Host. Stink or candy grass. Waste places, very

common. Lincoln; Crete; Valentine; Hardy; Tecumseh; Weeping Water; Cambridge; Broken Bow; Thedford; and Hitchcock, Howard, Furnas, and Polk counties.

999. *Eragrostis pectinacea* (Michx.) Gray. "False red top." Waste places, common. Lincoln; Valentine; Weeping Water; Hardy.

1000. *Eragrostis purshii* Schrad. Eragrostis. Waste places, not uncommon. Weeping Water; Broken Bow; Howard county.

1001. *Eragrostis reptans* (Michx.) Nees. Low, wet places, borders of ponds, etc., common. Lincoln; Weeping Water.

1002. *Eragrostis tenuis* (Ell.) Gray. Blow-out grass. In sandy places, frequently in "blow-outs." Dismal river, Thomas county, July 13; Howard county; Valentine.

363. CATABROSA Beauv.

1003. *Catabrosa aquatica* (L.) Beauv. Water grass. In edges of ponds and streams, rare. Dismal and Loup rivers, in Thomas county. Oldish specimens may readily be taken for *Sporobolus* by the dropping of the one or two upper flowers, leaving the spikelet apparently one-flowered. The rachis breaks off at the base of the palet of the lower flower between the two nerves and is easily overlooked.

364. EATONIA Raf. Eatonia.

1004. *Eatonia obtusata* (Michx.) Gray. Prairie grass. Rather low prairies, common. Lincoln; Weeping Water; Furnas county; Thedford; Hat Creek basin, Sioux county.

1005. *Eatonia obtusata* (Michx.) Gray, var. *robusta* Vasey. Low prairies. Thedford, July 14; Broken Bow, July 4; Belmont, July 25.

1006. *Eatonia pennsylvanica* (Spreng.) Gray. Damp woods in canons, rare. Belmont, July 18. A very slender grass with a loose panicle, thus easily distinguished from the two preceding.

365. KŒLERIA Pers.

1007. *Kœleria cristata* Pers. June grass. Prairies, common. Valentine; Lincoln; Crete; Hardy; Fort Robinson; Weeping Water; Broken Bow; Thedford; Belmont; and Hitchcock, Howard, and Valley counties.

366. MUNROA Torr.

1008. *Munroa squarrosa* Torr. False buffalo grass. Dry banks and prairies, common. McCook, Fort Robinson; Belmont; Anselmo; Thedford.

367. PHRAGMITES Trin. Reed grass.

1009. *Phragmites vulgaris* (Lam.) B. S. P. (*P. communis* Trin.) Edges of ponds, common. Alliance; Anselmo; Lincoln; Weeping Water; Valentine; Howard county; Kearney county.

368. TRIPLASIS Beauv.

1010. *Triplasis purpurea* (Walt.) Chapm. Sand grass. Valentine (Bates). U.

369. TRIODIA R. Br.

1011. *Triodia seslerioides* (Michx.) Benth. (*Tricuspis seslerioides* Torr.) Tall red-top. Roadsides, Richardson county, August 24. A very beautiful grass, about three feet high, with large, shiny, reddish-brown, 5–7 flowered spikelets, which are about 7 or 8 millimetres in length.

370. BUCHLOE Engelm.

1012. *Buchloe dactyloides* Engelm. Buffalo grass. Prairies, common. Once the predominating grass, now found only in small patches, becoming in some places quite rare. Lincoln; Crete; Franklin; Valentine; Weeping Water; McCook; Broken Bow; Anselmo; Thedford; Alliance; Crawford; Harrison, Hitchcock county; Furnas county.

371. BOUTELOUA Lag. Mesquite grass.

1013. *Bouteloua hirsuta* Lag. Bristly mesquite grass. Prairies, common. Dundy county; Hastings; Weeping Water; Valentine; Fort Robinson; Belmont; Harrison.

1014. *Bouteloua oligostachya* Torr. "Gramma." Prairies, common. Hitchcock, Howard, Furnas, Dundy, and Valley counties; Valentine; Weeping Water; Hardy; Harrison; Belmont; Thedford.

1015. *Bouteloua racemosa* Lag. Mesquite grass. Common on prairies, etc. Hitchcock, Furnas, Chase, Polk, and Valley counties; Lincoln; Valentine; Hardy; Weeping Water; Crete; Fort Robinson; Cambridge; Hastings.

372. SCHEDONNARDUS Steud.

1016. *Schedonnardus texanus* Steud. Wire grass. Prairies, common. Furnas, Hitchcock, and Valley counties; Lincoln; Weeping Water; Belmont; Anselmo; Thedford. Apparently a worthless grass that cattle shun.

373. CALAMAGROSTIS Adans. Reed bent grass.

1017. *Calamagrostis canadensis* (Michx.) Beauv. Blue-joint grass. Prairies; not so common as the next. Hitchcock and Valley counties.

1018. *Calamagrostis longifolia* Hook. Sand grass. Dry prairies; very common in sandy places. Hitchcock, Dundy, and Box Butte counties; Valentine; Fort Robinson; Belmont; Anselmo; Harrison; Dismal river in Thomas county.

1019. *Calamagrostis stricta* Trin. Yellow-top. Low prairies, canons, etc.; common in the western part of the state. Valley county; Anselmo, Hat Creek basin in Sioux county. Some valleys in Sioux county have an almost exclusive growth of this. It is reported as a very valuable grazing grass.

374. CINNA L.

1020. *Cinna pendula* Trin. (*C. arundinacea* L. var. *pendula* Gray.) Wood reed grass. In woods, Lincoln; Weeping Water.

375. AGROSTIS L. Bent grass.

1021. *Agrostis alba* L. Wooded canons and low prairies; common. Broken Bow; Thedford; Belmont; Hat Creek basin in Sioux county.

1022. *Agrostis alba* L. var. VULGARIS (With.) Thurb. (*A. vulgaris* With.) Red-top. Furnas county; Lincoln; Weeping Water; Broken Bow.

1023. *Agrostis exerata* Trin. Northern red-top; mountain red-top. Wet places in canons. Belmont; Hat Creek basin in Sioux county; Lincoln. Distinguished from *A. alba* chiefly by the smaller size of the palet, being reduced to a mere scale, or almost entirely wanting.

1024. *Agrostis perennans* (Walt.) Tuck. Thin grass. Cass county.

1025. *Agrostis hiemalis* (Walt.) B. S. P. (*A. scabra* Willd.) Hair grass; fly away grass. Prairies, etc., common. Crete; Weeping Water; Broken Bow; Anselmo; Belmont; Thedford; Hitchcock county; Howard county; Furnas county.

376. SPOROBOLUS R. Br. Drop-seed grass; rush grass.

1026. *Sporobolus airoides* (Steud.) Torr. Alkali grass. Alkaline prairies, common. Valley county; Valentine; Alliance.

1027. *Sporobolus asper* (Michx.) Beauv. Prairie grass. Howard county; Valentine; Lincoln.

1028. *Sporobolus asperifolius* (N. & M.) Thurb. Prairie grass. Dry prairies. Alliance; Weeping Water; Hitchcock county.

1029. *Sporobolus cuspidatus* Torr. Prairie grass, common on rather low prairies. Cass county; Polk county; Belmont; Hat Creek basin in Sioux county.

1030. *Sporobolus cryptandrus* (Trin.) Gr. Prairie grass. Prairies, etc., quite common. Hitchcock county; Valley county; Anselmo; Thedford; Crawford. Reported by farmers as an excellent grass for hay and pasturage.

1031. *Sporobolus depauperatus* Torr. Alliance (S.); Valentine (Bates). U.

1032. *Sporobolus heterolepis* Gray. Roadsides, Lincoln.

1033. *Sporobolus vaginæflorus* (Torr.) Vasey. Low prairies and waste places, common. Lincoln; Hardy; Brownville; Weeping Water.

377. PHLEUM L. Timothy; cat's-tail grass.

1034. *Phleum* PRATENSE L. Common Timothy. Common, escaped to waste places and roadsides. Lincoln; Crete; Brownville; Tecumseh; Geneva; Weeping Water; Hitchcock county; Furnas county; Anselmo; Thedford; Belmont.

378. BRACHYELYTRUM Beauv.

1035. *Brachyelytrum aristosum* (Michx.) B. S. P.. (*B. aristatum* Beauv.) Cass county.

379. MUHLENBERGIA Schreb. Muhlenberg's grass.

1036. *Muhlenbergia comata* (Thurb.) Benth. Nebraska. (Coulter's Manual.)

1037. *Muhlenbergia diffusa* Schreb. Drop-seed, or nimble Will. Dry hills, etc. Valley county; Lincoln; Geneva.

1038. *Muhlenbergia mexicana* (L.) Trin. Wood grass. Low grounds. Hitchcock county; Howard county; Weeping Water.

1039. *Muhlenbergia mexicana* (L.) Trin., var. *filiformis* Vasey. Lincoln. S.

1040. *Muhlenbergia pungens* Thurb. "Blow-out" grass. Sandy prairies, common. Long Pine; Dismal river in Thomas county; Belmont; Hat Creek basin in Sioux county. Leaves very pale and rigid; panicle open, reddish or purplish; palet in my specimens about one-half as long as the flowering glume, with two short setose points.

1041. *Muhlenbergia racemosa* (Michx.) B. S. P. (*M. glomerata* Trin.) Muhlenberg's grass. Waste places, in damp canons, etc., common. Howard county; Polk county; Belmont; Weeping Water; Valentine; Hardy; Lincoln.

380. ORYZOPSIS Michx. Mountain rice.

1042. *Oryzopsis cuspidata* (Nutt.) Benth. Dry prairies. Fort Robinson.

1043. *Oryzopsis micrantha* (Trin. & Rupr.) Thurb. (*Urachne micrantha* Trin. & Rupr.) Edges of water. Dismal river in Thomas county; Fort Robinson; Belmont. Awn about 1 centimetre long, very deciduous, springing from the apex of the flowering glume; in Nebraska specimens the base is surrounded by a little tuft of hairs. Oblong grain, closely inclosed by the palets, falling easily.

381. STIPA L. Feather grass.

1044. *Stipa comata* Trin. & Rupr. Porcupine grass. Very common in the western part of the state, replacing *S. spartea*, which in the eastern region is common. Fort Robinson; Broken Bow; Belmont; Thedford; Harrison.

1045. *Stipa spartea* Trin. Porcupine grass. Prairies in the eastern part of the state, common. Lincoln; Crete; Weeping Water; Gordon.

1046. *Stipa viridula* Trin. Low prairies, rare. Belmont, July 18. Distinguished from *S. comata* and *S. spartea* by its shorter (2½–4 cm.), twice bent awn; and small, short, flowering glume (5–6 millimetres long).

382. ARISTIDA L. Triple awned grass.

1047. *Aristida basiramea* Engelm. Beard grass. Prairies, not uncommon. Howard county; Broken Bow; Exeter.

1048. *Aristida purpurea* Nutt. Beard grass. Prairies, common. Hitchcock county; Dundy county; Broken Bow; Anselmo; Thedford; Belmont. A worthless bunch grass which is always left by cattle.

1049. *Aristida purpurea* Nutt. var. *hookeri* Tr. In bunches on high prairies. Belmont, August 4.

383. ALOPECURUS L. Fox-tail grass.

1050. *Alopecurus alpinis* Sm. Prairies, rare. Rushville, July 29. U.

1051. *Alopecurus geniculatus* L. Water fox-tail. Low, wet places. Lincoln.

1052. *Alopecurus geniculatus* L. var. *aristulatus* (Michx.) Munro. Floating, or water foxtail. Plattsmouth; Belmont; Hat Creek basin, in Sioux county; Dismal river, in Thomas county. Common westward on wet, sandy soil.

1053. *Alopecurus* PRATENSIS L. Meadow fox-tail. Introduced. Lincoln.

384. PHALARIS L. Canary grass.

1054. *Phalaris arundinacea* L. Reed canary grass. Wet grounds, common. Lincoln.

1055. *Phalaris* CANARIENSIS L. Canary grass. Yards and waste places, common. Introduced. Lincoln; Crete.

385. ANDROPOGON L. Beard grass.

1056. *Andropogon hallii* Hack. Turkey-foot grass. Common on high lands in the western and central parts of the state. Howard, Furnas, and Cherry counties; Valentine; Long Pine; Fort Robinson; Thedford; Belmont; and Hat Creek basin, in Sioux county.

1057. *Andropogon nutans* L. (*Chrysopogon nutans* Benth. of Gray's Manual.) Bushy blue stem. Prairies, common. Hitchcock, Furnas, Valley, and Polk counties; Lincoln; Valentine; Crete; Hardy; Geneva; Weeping Water; Long Pine; Thedford.

1058. *Andropogon provincialis* Lam. (*Andropogon furcatus* Muhl. of Gray's Manual.) Big blue stem. Prairies and roadsides, common. Howard, Furnas, and Dundy counties; Lincoln; Weeping Water; Crete; Valentine; Hardy; Geneva; Cambridge; Long Pine; Thedford; Anselmo; Belmont.

1059. *Andropogon scoparius* Michx. Little blue stem, or red stem. Common on prairies — usually in compact bunches. Furnas county; Valley county; Lincoln; Valentine; Hardy; Fort Robinson; Geneva; Weeping Water; Long Pine; Hastings; Belmont; Anselmo.

1060. *Andropogon* SORGHUM Brot. var. HALEPENSIS (Nees.) Hack. Johnson grass. Escaped in places. Howard county; Hitchcock county.

386. LEERSIA Swartz.

1061. *Leersia oryzoides* (L.) Swartz. Rice cut-grass. Waste places, rare. Hitchcock county; Dundy county; Lincoln; Weeping Water.

1062. *Leersia virginica* Willd. White grass. Wooded banks of streams, etc., common. Hitchcock county; Lincoln; Weeping Water.

387. ZIZANIA L. Wild rice.

1063. *Zizania aquatica* L. Wild rice, also called water or Indian rice, water oats, etc. Edges of ponds; not uncommon in the eastern and central parts of the state. Lincoln; Weeping Water; Howard, Furnas, and Hitchcock counties.

388. TRIPSACUM L. Gama grass; sesame grass.

1064. *Tripsacum dactyloides* L. Low places. Rare. Weeping Water.

389. SPARTINA Schreb. Cord, or marsh grass.

1065. *Spartina cynosuroides* (L.) Willd. Cord grass. Edges of ponds and streams, common. Hitchcock county; Lincoln; Valentine; Geneva; Weeping Water; Long Pine; Anselmo; Thedford; Hat Creek basin in Sioux county.

1066. *Spartina gracilis* Trin. On the Platte river in Cheyenne county, August. Rare.

390. CENCHRUS L. Bur, or hedge-hog grass.

1067. *Cenchrus tribuloides* L. Sand-bur. Waste places, too common. Lincoln; Weeping Water; Peru; Long Pine; Thedford; Polk county. This is as yet rare in the western region.

391. SETARIA Beauv.

1068. *Setaria* GLAUCA (L.) Beauv. Yellow fox-tail. Waste places, fields, etc., common. Lincoln; Weeping Water; Peru; Furnas county; Belmont.

1069. *Setaria* ITALICA (L.) Kunth. Millet, or Bengal grass. Waste places; escaped. Hitchcock, Howard, and Valley counties; Anselmo; Lincoln.

1070. *Setaria* VIRIDIS (L.) Beauv. Green fox-tail; bottle grass. Waste places, common. Hitchcock, Polk, Howard, and Valley counties; Lincoln; Crete; Weeping Water; Hardy; Broken Bow; Belmont; Thedford.

392. PANICUM L. Panic grass.

1071. *Panicum agrostoides* Muhl. Red-top panicum. Rare. Valley county.

1072. *Panicum capillare* L. Old witch grass; tickle grass. Very common in waste places, edges of cultivated fields, etc. Valley, Dundy, Hitchcock, Furnas, and Polk counties; Lincoln; Crete; Weeping Water; Belmont; Broken Bow; Dismal river in Thomas county.

1073. *Panicum capillare* L. var. *macrospermum* Vasey. Roadsides, etc., more rare. Belmont, July 24. Smaller than the preceding, with more simple panicle and rather larger spikelets.

1074. *Panicum* CRUS-GALLI L. Barn-yard grass. Yards and waste places, common. Lincoln; Crete; Chadron; Cambridge; Weeping Water; Long Pine; Hastings; and Hitchcock, Furnas, and Valley counties.

1075. *Panicum* CRUS-GALLI L. var. HISPIDUM (Muhl.) Torr. Waste places, usually with the preceding. Lincoln.

1076. *Panicum depauperatum* Muhl. Panic grass. Rare. Valley county.

1077. *Panicum dichotomum* L. Prairies; not so common as *P. scoparium*, with which it is frequently confounded. Thedford, July 10; Howard county.

1078. *Panicum filiforme* L. Nebraska. (Gray's Manual, p. 630.)

1079. *Panicum proliferum* Lam. Panic grass. Waste places, common. Lincoln; Weeping Water.

1080. *Panicum* SANGUINALE L. Crab grass; finger grass. Waste places, common. Lincoln; Weeping Water; Hardy; Broken Bow.

1081. *Panicum scoparium* Lam. Small panic grass. On prairies, very common. Lincoln; Weeping Water; Belmont; Broken Bow; Thedford; Anselmo. Frequently confounded with *P. dichotomum*, from which it may easily be distinguished by its fewer flowered, more simple panicle, larger tumid spikelets, 9 nerved upper glume, and the transverse fold or furrow near the base of the flowering glume.

1082. *Panicum virgatum* L. Switch grass. Prairies and waste places, very common. Hitchcock, Howard, Furnas, Dundy, and Valley counties; Lincoln; Valentine; Hardy; Weeping Water; Cambridge; Long Pine; Broken Bow; Thedford; Dismal river in Thomas county; Belmont.

1083. *Panicum virgatum* L. var. *glaucum* Vasey. Thedford, July 10. A smaller upland or dry ground form, more slender and glaucous than the type, geniculate below.

393. BECKMANNIA Host.

1084. *Beckmannia erucæformis* Host. In dry canon, Anselmo, July 6. Specimens have also been sent from Valentine (Bates). A very beautiful grass, rare.

394. PASPALUM L.

1085. *Paspalum setaceum* Michx. Bead grass. Waste places, rare. Thedford and Dismal river, in Thomas county; Howard and Lancaster counties.

83. COMMELINACEÆ. (SPIDERWORT FAMILY.)

395. TRADESCANTIA L. Spiderwort.

1086. *Tradescantia virginica* L. Common spiderwort. Usually on low grounds, but spreading in the central region upon the sand hills. Lincoln; Weeping Water; Fairbury, Valentine; Fort Robinson; Anselmo, July 6; Belmont, July 24; Thedford, July 11.

396. COMMELINA L.

1087. *Commelina virginica* L. On sand hills in shade of large weeds and shrubs. Long Pine; Thedford, July 11.

84. JUNCACEÆ. (RUSH FAMILY.)

397. JUNCUS Tourn. Rush; bog-rush.

1088. *Juncus filiformis* L. Nebraska. (Gray's Manual, p. 540.)

1089. *Juncus nodosus* L. var. *megacephalus* Torr. Prairies. Louisville; Crete.

1090. *Juncus scirpoides* Lam. var. *echinatus* Engelm. Wet places; not uncommon. Lincoln.

1091. *Juncus tenuis* Willd. Low prairies; common. Lincoln; Weeping Water; Crete.

85. LILIACEÆ. LILY FAMILY.

398. ZYGADENUS Michx.

1092. *Zygadenus elegans* Pursh. Fort Robinson, May, 1890. (Collected by Rev. J. M. Bates.) U.

398½. DISPORUM Salisb.

1092½. *Disporum trachycarpum* (Watson) Benth. & Hook. (*Prosartes trachycarpa* Watson. At base of high bluffs. Hat Creek basin in Sioux county, August 2. Rare.

399. UVULARIA L.

1093. *Uvularia sessilifolia ?* L. (*Oakesia sessilifolia* (L.) Watson.) Nebraska. (Gray's Manual, p. 528.) .

400. CHAMÆLIRIUM Willd. Devil's-bit.

1094. *Chamælirium carolinianum* Willd. Blazing star. Nebraska. (Gray's Manual, p. 532.)

401. CALOCHORTUS Pursh.

1095. *Calochortus gunnisoni* Watson. Wooded sides of bluffs. Fort Robinson; Belmont; Hat Creek basin.

402. ERYTHRONIUM L.

1096. *Erythronium albidum* Nutt. "Spring Lily," White dog's-tooth violet. Open woods; common in the eastern part of the state. April. Lincoln; Plattsmouth; Wymore; Weeping Water.

1097. *Erythronium americanum* Ker. Yellow adder's-tongue. Wooded bluffs of the Missouri river. April. Peru.

403. LILIUM L. Lily.

1098. *Lilium canadense* L. Wild yellow lily. Otoe county; Weeping Water; July.

404. ALLIUM L. Onion; garlic.

1099. *Allium canadense* Kalm. Wild garlic. Lincoln; Crete.

1100. *Allium mutabile* Michx. Prairie onion. Low prairies; common. Antelope county; Lincoln; Weeping Water; Crete; Thedford, July 14.

1101. *Allium nuttallii* Watson. Prairies. Antelope county.

1102. *Allium stellatum* Fraser. Wild onion. Sides of wooded bluffs. Belmont, July 18; Hat Creek basin, in Sioux county, August 2.

405. NOTHOSCORDUM Kunth.

1103. *Nothoscordum striatum* (Jacq.) Kunth. Nebraska. (Coulter's Manual.)

406. LEUCOCRINUM Nutt.

1104. *Leucocrinum montanum* Nutt. McCook, and Cheyenne county.

407. YUCCA L. Spanish bayonet.

1105. *Yucca angustifolia* Pursh. Spanish bayonet; Indian soap-weed. Prairies, very common in the central part of the state, and westward. Box Butte county; Broken Bow; Thedford; Dismal river, in Thomas county; Belmont; Alliance.

408. SMILACINA Desf. False Solomon's seal.

1106. *Smilacina amplexicaulis* (Watson) Nutt. Wooded banks and canons, common in the central and western parts of the state. Fort Robinson; Fremont; Anselmo, July 6; Belmont, July 18.

1107. *Smilacina stellata* (L.) Desf. Common false Solomon's seal. Wooded banks of streams in eastern Nebraska, common. Lincoln; Crete; Weeping Water.

409. POLYGONATUM Adans. Solomon's seal.

1108. *Polygonatum commutatum* (Schult.) Dietr. (*P. giganteum* Dietr.) Woods, common. Lincoln; Weeping Water; Crete.

410. ASPARAGUS L. Asparagus.

1109. *Asparagus* OFFICINALIS L. Garden asparagus. Escaped to waste places and banks of streams. Lincoln.

411. SMILAX L. Greenbrier; catbrier.

1110-11. *Smilax herbacea* L. Carrion flower. In woods along river banks, common. Milford; Lincoln; Peru; Tecumseh; Wymore; Weeping Water.

1112. *Smilax hispida* Muhl. Greenbrier. Wooded banks of streams, common. Lincoln; Tecumseh; Brownville; Crete; Weeping Water.

86. AMARYLLIDACEÆ. (AMARYLLIS FAMILY.)

412. HYPOXYS L. Star grass.

1113. *Hypoxys erecta* L. Star grass. Meadows, etc., June. Otoe county.

87. IRIDACEÆ. (IRIS FAMILY.)

413. SISYRINCHIUM L. Blue-eyed grass.

1114. *Sisyrinchium mucronatum* Michx. (*S. bermudiana* var. *mucronatum* Gray.) Low grounds, common. May, June. Lincoln; Crete; Weeping Water.

88. ORCHIDACEÆ. (ORCHIS FAMILY.)

414. CYPRIPEDIUM L. Lady's slipper; moccasin flower.

1115. *Cypripedium candidum* Muhl. Small white lady's slipper. Antelope county; Knox county, June.

1116. *Cypripedium pubescens* Willd. Larger yellow lady's slipper, or moccasin flower. Peru, May; Belmont (?), July 24.

415. HABENARIA Willd. Rein orchis.

1117. *Habenaria leucophæa* (Nutt.) Gray. Greenish fringed orchis. Low wet prairies, not uncommon. July. Lincoln.

416. ORCHIS L.

1118. *Orchis spectabilis* L. Showy orchis. Rich woods, May. Plattsmouth; Peru; Antelope county.

417. SPIRANTHES L. Ladies' tresses.

1119. *Spiranthes romanzoffiana* Cham. Wet prairies and canons; common in the western part of the state. Thedford, July 11; Belmont, July 18; Hat Creek basin, in Sioux county, August 1.

Sub-Class II.—Dicotyledones.

89. CUPULIFERÆ. (OAK FAMILY.)

418. QUERCUS L. Oak.

1120. *Quercus alba* L. White oak. Weeping Water. W.

1121. *Quercus coccinea* Wang. Scarlet oak. Eastern part of the state; bluffs of the Missouri river. Richardson county, August 26; Peru, May.

1122. *Quercus ilicifolia* Wang. Bear, or black scrub oak. Weeping Water. W.

1123. *Quercus imbricaria* Michx. Laurel, or shingle oak. East Nebraska. (Gray's Manual, p. 478.)

1124. *Quercus macrocarpa* Michx. Bur oak; over-cup or mossy-cup. Rich soil along streams; very common in the eastern part of the state. Richardson county; Antelope county; Lincoln; Wymore; Weeping Water; Peru; Crete; Long Pine.

1125. *Quercus muhlenbergii* Engelm. Yellow oak; chestnut oak. East Nebraska. (Gray's Manual, p. 476.)

1126. *Quercus nigra* L. Black jack, or barren oak. East Nebraska. (Gray's Manual, p. 478.)

1127. *Quercus prinoides* Willd. (*Q. prinus* var. *humilis* Marsh.) A small bush about three feet high. Bluffs of Missouri river; Richardson county, August 15.

1128 *Quercus rubra* L. Red oak. Weeping Water. W.

1129. *Quercus stellata* Wang. (*Q. obtusiloba* Michx.) Post oak, or iron oak. East Nebraska. (Gray's Manual, p. 475.)

419. CORYLUS L. Hazelnut.

1130. *Corylus americana* Walt. Common in the eastern part of the state. Wymore; Weeping Water; Peru; Omaha; Richardson county.

420. OSTRYA Scop.

1131. *Ostrya virginiana* (Mill.) B. S. P. (*O. virginica* Willd.) Hop-hornbean; iron-wood. Long Pine. B.

421. ALNUS Gærtn. Alder.

1132. *Alnus incana ?* Willd. Speckled, or hoary alder. East Nebraska. (Gray's Manual, p. 473.)

422. BETULA L. Birch.

1133. *Betula nigra* L. River, or red birch. Banks of Missouri river; Plattsmouth. W.

1134. *Betula occidentalis* Hook. Black birch. In canons; common in the extreme northwestern part of the state. Hat Creek basin, in Sioux county, August 1. A shrub or small tree from eight to sixteen feet high.

90. JUGLANDACEÆ. (WALNUT FAMILY.)

423. JUGLANS L.

1135. *Juglans cinerea* L. Butternut; white walnut. River banks; rare. Wymore; Weeping Water; Nebraska City.

1136. *Juglans nigra* L. Black walnut. Rich soil, river banks; common. June. Lincoln; Wymore; Weeping Water; Long Pine.

424. HICORIA Raf. Hickory trees.

1137. *Hicoria alba ?* (L.) Britton. (*Carya tomentosa* Nutt.) East Nebraska. (Gray's Manual, p. 469.)

1138. *Hicoria minima* (Marsh.) Britton. (*Carya amara* Nutt.) Bitter-nut, or swamp hickory. River banks; common in eastern Nebraska along the Missouri river. Peru; Lincoln; Weeping Water.

1139. *Hicoria ovata* (Mill.) Britton. (*Carya alba* Nutt.) Shell-bark, or shag-bark hickory. River banks; not uncommon. Wymore; Peru; Plattsmouth; Richardson county.

1140. *Hicoria glabra* (Mill.) Britton. (*Carya porcina* Nutt.) Pig-nut, or broom hickory. Weeping Water. W.

91. SALICACEÆ. (WILLOW FAMILY.)

425. POPULUS L. Poplar; aspen.

1141. *Populus angustifolia* James. Black cottonwood. Canons. Hat Creek basin, Sioux county, August 2, 1889. The streets of Fort Robinson, in Dawes county, are lined with trees of this species, transplanted from this region.

1142. *Populus balsamifera* L. var. *candicans* Gray. Balsam poplar, or Tacamahac. Wooded valleys and canons. Hat Creek basin, in Sioux county, August 2, 1889.

1143. *Populus monilifera* Ait. (Includes *P. angulata* Ait.) Cottonwood; necklace poplar. Very common along streams, etc., all over the state. Lincoln; Weeping Water; Peru; Omaha; Tecumseh; Anselmo; Thedford; Broken Bow; Belmont; Hat Creek basin.

1144. *Populus tremuloides* Michx. American aspen. Rich soil. Brownville, on Missouri river valley, and Hat Creek basin in Sioux county.

426. SALIX L. Willow; osier.

1145. *Salix cordata* Muhl. var. *vestita* Anders. Diamond willow; heart-leaved willow. Banks of streams, common. Peru; Long Pine; Belmont; Hat Creek basin, in Sioux county.

1146. *Salix humilis* Marshall. Prairie willow. Prairies; common. Cass county; Richardson county; Lincoln; Long Pine; Anselmo.

1147. *Salix amygdaloides* Anders. Fort Robinson; Long Pine; Crete. B.

1148. *Salix lucida* Muhl. Shining willow. Weeping Water.

1149. *Salix longifolia* Muhl. Long-leaved willow. Low places, banks of streams, etc., common. Lincoln; Crete; Milford; Peru; Weeping Water; Pierce; Anselmo.

1150. *Salix nigra* Marshall. Black willow. River banks, etc.; very common, especially in the eastern part of the state. Peru; Lincoln; Fairbury; Weeping Water.

92. URTICACEÆ. (NETTLE FAMILY.)

427. PARIETARIA L. Pellitory.

1151. *Parietaria pennsylvanica* Muhl. Pellitory. Damp woods, common. July. Lincoln; Weeping Water; Belmont, July 21.

428. PILEA Lindl.

1152. *Pilea pumila* (L.) Gray. Richweed; clearweed. Cold, damp woods, common. August. Lincoln; Weeping Water.

429. LAPORTEA Gaudich. Wood-nettle.

1153. *Laportea canadensis* (L.) Gaudich. Wood-nettle. Damp woods, common. Lincoln; Weeping Water.

430. URTICA L. Nettle.

1154. *Urtica gracilis* Ait. Common nettle. Fence rows, moist places, etc., common. July–September. Lincoln; Long Pine; Weeping Water; Omaha.

1155. *Urtica dioica* L. Introduced. Weeping Water. W.

431. MORUS L. Mulberry.

1156. *Morus rubra* L. Red mulberry. Along streams in the eastern part of the state. B.

1157. *Morus* ALBA L. White mulberry. Introduced. Weeping Water. W.

432. CANNABIS L. Hemp.

1158. *Cannabis* SATIVA L. Common hemp. Waste grounds, common. Introduced. Lincoln; Howard county; Antelope county; Weeping Water; Belmont.

434. HUMULUS L. Hop.

1159. *Humulus lupulus* L. Common hop. Woods, not uncommon. Lincoln; Valentine; Weeping Water; Belmont; and Richardson county.

435. CELTIS L. Hackberry.

1160. *Celtis occidentalis* L. Hackberry; sugar-berry. Banks of streams, canons, etc., common. Peru; Weeping Water; Anselmo; Dismal river, in Thomas county; Belmont; and Hat Creek basin, in Sioux county.

436. ULMUS L. Elm.

1161. *Ulmus americana* L. American, or white elm. Banks of creeks, canons, etc., common. Lincoln; Weeping Water; Crete; Peru; Richardson county; Belmont; Hat Creek basin, in Sioux county.

1162. *Ulmus fulva* Michx. Slippery, or red elm. Rich soil, river banks; not uncommon. Plattsmouth; Wymore; Weeping Water; Peru; Richardson county.

93. PLATANACEÆ. (PLANE-TREE FAMILY.)

437. PLATANUS L. Button-wood; plane tree.

1163. *Platanus occidentalis* L. American plane; sycamore. On the banks of the Missouri river. Here quite common, but not occurring in the central and western regions of the state. Peru; Brownville; and Richardson county.

93½. POLYGONACEÆ. (BUCKWHEAT FAMILY.)

438. RUMEX L. Dock; sorrel.

1164. *Rumex* ACETOSELLA L. Field, or sheep sorrel. Waste places; becoming common. Introduced. May. Lincoln; Wymore.

1165. *Rumex altissimus* Wood. (*R. britannica* Gray, not L.) Pale dock. Waste places; common. June–August. Lincoln; Weeping Water.

1166. *Rumex* CRISPUS L. Curled dock. Waste places; common. Introduced. July. Lincoln.

1167. *Rumex maritimus* L. Golden dock. Low, wet grounds. Crawford, July 29.

1168. *Rumex salicifolius* Weinmann. White dock. Waste places. Lincoln; Crete.

1169. *Rumex venosus* Pursh. Winged dock. Usually on sandy prairies. Cherry county; Antelope county; Cheyenne county; Fairfield; Thedford; Belmont.

439. **FAGOPYRUM** Gærtn. Buckwheat.

1170. *Fagopyrum* ESCULENTUM Mœnch. Common cultivated buckwheat. Escaped to roadsides and waste places. Lincoln; Weeping Water.

440. **POLYGONUM** L. Knotweed.

1171. *Polygonum acre* H. B. K. Water smartweed. Roadsides, etc. Weeping Water. W.

1172. *Polygonum amphibium* L. Water persicaria. In edge of water. Weeping Water, and Richardson county, August 25.

1173. *Polygonum* AVICULARE L. Knot-grass; door-weed; goose-grass. House yards and roadsides; very common. Introduced. Lincoln; Crete; Weeping Water; Anselmo.

1174. *Polygonum* CONVOLVULUS L. Black bindweed. Waste places; common. Introduced. Lincoln; Fairbury; Saunders county; Anselmo, July 6; Thedford, July 11.

1175. *Polygonum dumetorum* L. var. *scandens* (L.) Gray. Climbing false buckwheat. Roadsides and waste places; common. Lincoln; Weeping Water.

1176. *Polygonum erectum* L. (*P. aviculare* L. var. *erectum* Roth.) Knot-grass; door-weed. Roadsides and yards; not uncommon. Fort Robinson; Lincoln; Weeping Water.

1177. *Polygonum hartwrightia* Gray. Persicaria. In edges of ponds; not very common. Thedford, August 7.

1178. *Polygonum hydropiper* L. Common smartweed or water pepper. Wet places; common. July. Lincoln; Weeping Water.

1179. *Polygonum incarnatum* Ell. Smartweed. Edges of ponds; not uncommon. Lincoln; Weeping Water; Belmont, July 25. In my Lincoln specimens, clearly referable to this species, I find many flowers that have the perianth four-parted instead of five-parted. *P. incarnatum* comes under the sub-genus *Persicaria*, of which "perianth five-parted" is made a principal character in all manuals so far as I know.

1180. *Polygonum persicaria* L. Lady's thumb. Waste places; common. July. Lincoln; Weeping Water.

1181. *Polygonum pennsylvanicum* L. Smartweed. Waste places; common. Crete; Weeping Water; Lincoln.

1182. *Polygonum ramosissimum* Michx. Knotweed. Waste places, very common. July. Lincoln; Crete; Weeping Water; Polk county.

1183. *Polygonum sagittatum* L. Arrow-leaved tear thumb. Long Pine. B.

1184. *Polygonum tenue* Michx. Slender knotgrass. Barren waste lands; not uncommon. Lincoln; Weeping Water; Anselmo, July 6.

1185. *Polygonum terrestre* (Willd.) B. S. P. (*P. amphibium* L. var. *terrestre* Willd.) Water persicaria. Waste places, fields, etc. Peru; Lincoln; Weeping Water; Kennedy. July and August.

1186. *Polygonum virginianum* L. Persicaria. Thickets; common in the eastern part of the state. Lincoln, August; Richardson county, August 25.

441. ERIOGONUM Michx.

1187. *Eriogonum alatum* Michx. Nebraska. (Watson, Pro. Am. Acad., vol. VII, p. 254, and Coulter's Manual.)

1188. *Eriogonum annuum* Nutt. Prairies; very common from central Nebraska westward. Antelope county; Valentine; Ewing; Dismal river in Thomas county, July 13; Anselmo, July 6; Hat Creek basin in Sioux county, August 1; Belmont, July 27; Court House rock, Cheyenne county.

1189. *Eriogonum flavum* Nutt. Rocky ridges. Belmont, July 25; Hat Creek basin in Sioux county, August 2; Court House rock, Cheyenne county.

1190. *Eriogonum multiceps* Nees. Hat Creek basin, Sioux county, August 2. In dry valleys, spreading up the hills; quite commonly associated with Artemisia. A few specimens have the involucre six-toothed instead of five, and the flowers greenish white. Very similar to *E. pauciflorum* Nutt., from which it is distinguished by being densely white tomentose throughout; by its pinkish pubescent flowers; and rigid, narrowly turbinate, tomentose, very short and narrow five-toothed involucre.

94. CHENOPODIACEÆ. (GOOSEFOOT FAMILY.)

442. SUÆDA Forskal. Sea blite.

1191. *Suæda linearis* (Ell.) Torr. var. *salsa* (Michx.) B. S. P. (*S. maritima* of Gray.) Low, alkaline lands, banks of ponds, etc., common. Lincoln; Alliance.

443. SALSOLA L. Saltwort.

1192. *Salsola kali* L. Common saltwort. River bottoms. Cherry county. (Bates.) U.

444. SARCOBATUS Nees. Greasewood.

1193. *Sarcobatus vermiculatus* Torr. Greasewood. Bad-lands, rare. Hat Creek basin, Sioux county, August 1. A spinescent shrub, 1½–2 feet high, with a smooth, white bark.

445. SALICORNIA L. Glasswort; samphire.

1194. *Salicornia herbacea* L. Glasswort; samphire. Salt basin, common. Lincoln.

446. CORISPERMUM A. Jussieu. Bug-seed.

1195. *Corispermum hyssopifolium* L. Waste, sandy places, etc., common. Lincoln; Weeping Water; Crawford, July 29; Hat Creek basin, in Sioux county, August 2; Dismal river, in Thomas county, July 12.

447. ATRIPLEX L. Orache.

1196. *Atriplex patula* L. var. *hastata* (L.) Gray. Barren saline lands, common. Lincoln; Alliance.

1197. *Atriplex nuttallii* Watson. More or less alkaline lands; not so common as the preceding. September. Lincoln.

448. CHENOPODIUM L. Pigweed; goosefoot.

1198. *Chenopodium* ALBUM L. Lamb's quarters; pigweed. Waste places everywhere. Lincoln; Weeping Water; Hastings; Peru; Anselmo; Broken Bow; Thedford; Belmont. (Nat. from Europe.)

1199. *Chenopodium* HYBRIDUM L. Maple-leaved goosefoot. Shady places, common. Lincoln; Crete; Weeping Water. (Nat. from Europe.)

449. CYCLOLOMA Moquin. Winged pigweed.

1200. *Cycloloma platyphyllum* Moquin. Waste places, sandy banks, etc., not uncommon. July–September. Lincoln; Long Pine; Louisville;

Weeping Water; Antelope county. When old, this frequently assumes a reddish-purple color.

95. AMARANTACEÆ. (AMARANTH FAMILY.)

450. **Frœlichia** Moench.

1201. *Frœlichia floridana* Moquin. Prairies, usually sandy, common. Antelope county; Valley Junction; Long Pine; Anselmo, July 1; Dismal river, in Thomas county, July 13.

451. **Acnida** L. Water hemp.

1202. *Acnida tuberculata* Moq. (*Montelia tamariscina* Gray in part.) Waste places; a common weed. Lincoln; Crete; Tecumseh; Weeping Water.

452. **Amarantus** L. Amaranth.

1203. *Amarantus albus* L. Tumble weed. Lincoln; Weeping Water. W.

1204. *Amarantus blitoides* Watson. Prairies and waste places; common. Lincoln; Crete; Hastings; Weeping Water.

1205. *Amarantus retroflexus* L. Pigweed; green amaranth. Waste places; a troublesome weed. Lincoln; Crete; Long Pine; Weeping Water; Tecumseh.

96. PHYTOLACCACEÆ. (POKEWEED FAMILY.)

453. **Pytolacca** L.

1206. *Phytolacca decandra* L. Common poke, or scoke weed; garget; pigeon berry. Roadsides. Missouri river valley; Richardson county, August 26.

97. NYCTAGINACEÆ. (FOUR-O'CLOCK FAMILY.)

454. **Abronia** Juss.

1207. *Abronia fragans* Nutt. Prairies; common. Alliance, August 7; Belmont, July 25; Cheyenne county.

455. **Oxybaphus** Vahl.

1208. *Oxybaphus angustifolius* Sweet. Prairies and waste places; common. June–July. Lincoln; Weeping Water; Arapahoe; Crete; Fairbury; Hastings; Long Pine; Alliance.

1209. *Oxybaphus hirsutus* Sweet. Prairies; not uncommon. June and July. Lincoln; Fort Robinson; Long Pine; Anselmo.

1210. *Oxybaphus nyctagineus* Sweet. Roadsides and yards, common. May and June. Lincoln; Crete; Weeping Water; Fairbury.

1211. *Oxybaphus nyctagineus* Sweet, var. *oblongifolius* Gray. Roadsides, common. July. Lincoln; Seward county.

97½. CARYOPHYLLACEÆ. (PINK FAMILY.)

(Including *Illecebraceæ.*)

456. **Arenaria** L. Sandwort.

1212. *Arenaria lateriflora* L. Long Pine, May. U.

1213. *Arenaria pungens* Nutt. High prairies and rocky barren hills, common. Fort Robinson; Gordon; Belmont, July 13.

457. **Cerastium** L. Mouse-ear chickweed.

1214. *Cerastium nutans* Raf. Mouse-ear chickweed. Low prairies; rare. May. Lincoln.

458. **Silene** L. Catchfly; campion.

1215. *Silene antirrhina* L. Sleepy catchfly. Prairies and waste places; common. May–June. Lincoln; Fairbury; Crete; Weeping Water; Belmont; Dismal river in Thomas county.

1216. *Silene* NOCTIFLORA L. Night-flowering catchfly. Waste places; rather uncommon. Introduced. June. Lincoln.

1217. *Silene stellata* (L.) Ait. Starry campion. Wooded banks; quite common in the eastern part of the state. July. Lincoln; Crete; Weeping Water; Richardson county.

459. SAPONARIA L.

1218. *Saponaria* OFFICINALIS L. Soap-wort; bouncing Bet. Escaped to roadsides. Richardson county, August 25.

460. PARONYCHIA Tourn.

1219. *Paronychia jamesii* Torr. & Gr. High prairies. Sioux county, July 30; Fort Robinson, May.

98. PORTULACEÆ. (PURSLANE FAMILY.)

461. CLAYTONIA L. Spring beauty.

1220. *Claytonia virginica* L. Narrow-leaved spring beauty. In damp woods; on the bluffs of the Missouri river. Probably limited to the eastern region. Omaha, April.

462. TALINUM Adans.

1221. *Talinum teretifolium* Pursh. Sand hills, etc. July–August. Dawes county; Long Pine.

463. PORTULACA L. Purslane.

1222. *Portulaca* OLERACEA L. Common purslane. Gardens, waste places, etc.; common. July. Lincoln; Weeping Water. (Nat. from Europe.)

99. BERBERIDACEÆ. (BARBERRY FAMILY.)

464 PODOPHYLLUM L. May apple; mandrake.

1223. *Podophyllum peltatum* L. Common May apple, or mandrake. Richardson county; Brownville.

465. BERBERIS L. Barberry.

1224. *Berberis repens* Lindl. Rocky places, canons, etc. A low shrub (15–35 cm. high); common in northwestern Nebraska; Belmont, July 24; Hat Creek basin in Sioux county, August 1.

100. MENISPERMACEÆ. (MOONSEED FAMILY.)

466. MENISPERMUM L. Moonseed.

1225. *Menispermum canadense* L. Canadian moonseed. Wooded banks; common; climbing over shrubs, etc. June–July. Fairbury; Peru; Crete; Lincoln; Weeping Water.

101. ANONACEÆ, (CUSTARD-APPLE FAMILY.)

467. ASIMINA Adans. North American papaw.

1226. *Asimina triloba* (L.) Dunal. Common papaw. Rich soil; common in southeastern Nebraska along the Missouri river. Richardson county; Peru; Nebraska City.

102. RANUNCULACEÆ. (CROWFOOT FAMILY.)

468. ACTÆA L. Baneberry; cohosh.

1227. *Actæa spicata* L. var. *rubra* Ait. Red baneberry. In damp wooded canons. Hat Creek basin, August 2; Belmont, July 25. With bright shiny red, oval or elliptical berries.

469. DELPHINIUM L. Larkspur.

1228. *Delphinium azureum* Michx. Azure larkspur. Common on low prairies. Flowers whitish. June and July. Lincoln; Fairbury; Peru; Weeping Water; Crete; Dismal river in Thomas county.

1229. *Delphinium exaltatum* Ait. Tall larkspur. In open woods and low prairies, common in the eastern part of the state. May–July. Weeping Water; Peru; Saltillo, and Otoe county.

470. AQUILEGIA L. Columbine.

1230. *Aquilegia canadensis* L. Wild Columbine. Rocky banks in woods, in shaded canons, etc.; common. May–July. Richardson county; Wymore; Weeping Water; Peru; Fremont; Belmont.

471. MYOSURUS Dill. Mouse-tail.

1231. *Myosurus minimus* L. Little mouse-tail. Low, wet grounds, common. May. Lincoln; Weeping Water.

472. RANUNCULUS L. Crowfoot; buttercup.

1232. *Ranunculus abortivus* L. Small flowered crowfoot. In or near woods in wet places, common. May–June. Lincoln; Weeping Water; Peru; Crete.

1233. *Ranunculus* ACRIS L. Tall crowfoot. Buttercups. Spreading into the eastern part of the state. Peru.

1234. *Ranunculus aquatilis* L. var. *trichophyllus* Gray. Common white water-crowfoot. In streams, very abundant. Long Pine; Weeping Water; Lincoln; Anselmo; Thedford; Belmont.

1235. *Ranunculus cymbalaria* Pursh. Sea-side crowfoot. Marshy grounds, edges of streams, etc., common. Antelope county; Columbus; Broken Bow, July 4; Crawford, July 29; Alliance, August 6. In places it forms dense patches from 7–10 centimetres high. Its long rooting runners spread out in all directions and touching here and there send up clusters of leaves and stems, crowding their way through the surrounding vegetation.

1236. *Ranunculus romboideus* Goldie. Sea-side crowfoot. Low, wet grounds. April and June. Antelope county; Long Pine.

1237. *Ranunculus multifidus* Pursh. Yellow water crowfoot. In water, not common. Valentine; Crete. U.

1238. *Ranunculus nuttallii* Gray. Crowfoot. Low, wet grounds. Antelope county.

1239. *Ranunculus pennsylvanicus* L. In ravines, rare. Belmont. Dawes county, July 21. Altitude 4,600 feet.

1240. *Ranunculus recurvatus* Poir. Hooked crowfoot. Weeping Water. W.

1241. *Ranunculus sceleratus* L. Cursed crowfoot. In edges of water, rare. Belmont, July 18. From 15–25 centimetres high. Low specimens leafy.

473. ADONIS L. Pheasant's eye.

1242. *Adonis* AUTUMNALIS L. Escaped from cultivation. Lincoln. P.

474. ANEMONE L. Wind flower.

1243. *Anemone decapetala* L. (*A. caroliniana* of Gray's Manual.) Anemone. Common on prairie. May–June. Lincoln; Fairbury; Peru; Crete; West Point; Weeping Water; Harlan county; Hitchcock county.

1244. *Anemone cylindrica* Gray. Long fruited anemone. Prairies, common. June–July. Lincoln; Weeping Water; Crete; Anselmo, July 26; Belmont, July 24; Broken Bow, July 4. A form is quite commonly found having the peduncles *with an involucre* as in *A. dichotoma*, instead of naked. It may be a hybrid with *A. dichotoma*, but this species is not known to occur in all the places where the peculiarity has been observed. Lincoln; Broken Bow, July 4; Belmont, July 24.

1245. *Anemone dichotoma* L. (*A. pennsylvanica* L. of Gray's Manual.) Prairies, common in eastern Nebraska. May–July. Lincoln; Weeping Water; Nebraska City; Peru.

1246. *Anemone nemorosa* L. Wood anemone; wind flower. In woods, rare. Greenwood. P.

1247. *Anemone patens* L. var. *nuttalliana* Gray. Pasque flower. Prairies, common in north and northwestern Nebraska. Fort Robinson; West Point; Antelope county.

1248. *Anemone virginiana* L. Virginian anemone. Weeping Water. W.

1249. *Anemone multifida* Poir. Cut-leaved anemone. At base of high bluff in a ravine, rare. Belmont, Dawes county, July 24, 1889 (in fruit). My specimens differ somewhat from the usual form. The majority of them bear two peduncles, one of which has a two-leaved involucel somewhat below the middle; but quite a number have but a single naked peduncle. All of the leaves are usually twice or thrice three-parted or divided into linear divisions. The root leaves are long petioled (6–20 centimetres), those of the involucre short petioled, those of the involucels sessile or sub-sessile. The one-peduncled form is mentioned in Walpers' Repertorium, vol. I, p. 28, "*rarius abortu?* 1." I should not, from my specimens, take it to be an abortive form, as the one-peduncled specimens are among the largest and apparently most thrifty specimens of the lot.

475. ANEMONELLA Spach.

1250. *Anemonella thalictroides* (L.) Spach. (*Thalictrum anemonoides* Michx.) Rue-anemone. Woods, rare. Woodlawn. April. P.

476. THALICTRUM L. Meadow-rue.

1251. *Thalictrum purpurascens* L. Tall meadow-rue. Banks of streams; common. July–September. Lincoln; Peru; Crete; Weeping Water; Anselmo; Belmont.

477. CLEMATIS L. Virgin's bower.

1252. *Clematis ligusticifolia* Nutt. Virgin's bower. Climbing over bushes; very common. Long Pine; Fort Robinson; Dismal river in Thomas county, July 13; Belmont, July 18. A very beautiful climber, similar to *C. virginiana*, from which it is easily distinguished by its five-foliate leaves.

1253. *Clematis pitcheri* Torr. & Gray. Leather flower. River banks. Rare. June. Otoe county.

1254. *Clematis virginiana* L. Common virgin's bower. Not uncommon in the eastern part of the state. July. Lincoln; Peru; Weeping Water.

103. NYMPHÆACEÆ. (WATER LILY FAMILY.)

478. CASTALIA Salisb. (*Nymphæa* in part.) Water lily.

1255. *Castalia tuberosa* (Paine) Greene. (*Nymphæa tuberosa* Paine.) White water lily. In ponds, rare. Lincoln.

479. NYMPHÆA (L.) Salisb. (*Nuphar* Smith.)

1256. *Nymphæa advena* Soland. (*Nuphar advena* Ait.) Yellow pond lily. In ponds, rare. Weeping Water. W.

480. NELUMBO Tourn.

1257. *Nelumbo lutea* Pers. East Nebraska. (Gray's Manual, p. 55.)

104. PAPAVERACEÆ. (POPPY FAMILY.)

481. ARGEMONE L. Prickly poppy.

1258. *Argemone platyceras* Link & Otto. Prickly poppy. Prairies; very common. Long Pine; Thedford, August 7; Belmont, July 24; Anselmo, July 8. Flower very large and showy; white.

105. FUMARIACEÆ. (FUMITORY FAMILY.)

482. CORYDALIS DC.

1259. *Corydalis aurea* (Michx.) Willd. var. *occidentalis* Gr. Golden corydalis. Waste places; common. May–June. Lincoln; Fairbury; Belmont.

1260. *Corydalis aurea* (Michx.) Willd. var. *micrantha* Engelm. Golden corydalis. Somewhat rare. Peru.

1261. *Corydalis curvisiliqua* (Gray) Engelm. Golden corydalis. Waste places. Peru.

483. DICENTRA Borkh. Dutchman's breeches.

1262. *Dicentra cucullaria* (L.) DC. Dutchman's breeches. Rich woods, common in the eastern part of the state. May. Weeping Water; Peru; Wymore.

1263. *Dicentra canadensis* (Goldie.) DC. Squirrel corn. Woods, rare. Weeping Water. W.

106. CRUCIFERÆ. (MUSTARD FAMILY.)

484. LEPIDIUM Tourn. Pepperwort; peppergrass.

1264. *Lepidium intermedium* Gray. Wild peppergrass. Waste places, very common. Lincoln; Weeping Water.

1265. *Lepidium virginicum* L. Wild peppergrass. Common in waste places. Lincoln; Weeping Water; Peru.

485. CAPSELLA Mœnch.

1266. *Capsella* BURSA-PASTORIS (L.) Mœnch. Shepherd's purse. Everywhere in eastern Nebraska; a troublesome weed. April–September. Lincoln; Crete; Fairbury; Peru; Weeping Water.

486. BRASSICA L. Mustard.

1267. *Brassica* ALBA (L.) Gray. White mustard. Weeping Water. W. Introduced.

1268. *Brassica* ARVENSIS (L.) B. S. P. (*B. sinapistrum* Boiss.) Charlock. Waste places. Introduced. June. Lincoln; Peru; Crete; Long Pine, and Douglas county.

1269. *Brassica* NIGRA (L.) Koch. Black mustard. Introduced. W.

487. CAMELINA Crantz.

1270. *Camelina* SATIVA (L.) Crantz. False flax. Escaped to waste places. Crete; Weeping Water; Lincoln; Belmont; Broken Bow.

488. ERYSIMUM L. Treacle mustard.

1271. *Erysimum asperum* DC. var. *arkansanum* Gray. Western wall-flower. Prairies, common. Antelope county; Valentine; Belmont.

1272. *Erysimum cheiranthoides* L. Worm-seed mustard. Wooded banks of streams. July. Lincoln; Crete; Belmont; Anselmo; Dismal river in Thomas county.

489. SISYMBRIUM L. Hedge mustard.

1273. *Sisymbrium incisum* Engelm. Weeping Water, May. P.

1274. *Sisymbrium officinale* (L.) Scop. Hedge mustard. Waste places, common. June. Nebraska City; Lincoln.

1275. *Sisymbrium pinnatum* (Walt.) Greene. (*S. canescens* Nutt.) Tansy mustard. Roadsides, etc., common. May. Lincoln; Weeping Water.

490. DRABA L. Whitlow grass.

1276. *Draba caroliniana* Walt. Common in low places. March–June. Lincoln; Fairbury; Sydney; Valentine; Weeping Water.

1277. *Draba carolinana* Walt. var. *micrantha* (Nutt.) Gray. Weeping Water. W.

491. LESQUERELLA Watson. (*Vesicaria* of Am. manuals.)

1278. *Lesquerella alpina* (Nutt.) Watson. High rocky prairies and banks, common. Belmont, July 18.

1279. *Lesquerella ludoviciana* (DC.) Watson. High prairies, common. Belmont, July 25; Valentine, May 20. A beautiful species with pendulous pods. A form of this, found at Belmont, July 21, 1889, is more slender, has divergent upward curved pedicels, and longer styles.

492. ARABIS L. Rock cress.

1280. *Arabis canadensis* L. Sickle-pod. In woods, common. Nebraska City, June 2.

1281. *Arabis confinis* S. Watson. (*A. drummondii* Man.) Tower mustard. Crete, July 4.

1282. *Arabis hirsuta* (L.) Scop. Rock cress. Lincoln. P.

493. NASTURTIUM R. Br. Water cress.

1283. *Nasturtium* ARMORACIA (L.) Fries. Common horseradish. Escaped in places. Lincoln.

1284. *Nasturtium* OFFICINALE R. Br. True water cress. Escaped. Douglas county. U.

1285. *Nasturtium palustre* (L.) DC. Marsh cress. Lowlands. Lincoln; Fairbury.

1286. *Nasturtium palustre* (L.) DC. var. *hispidum* (Desv.) Fisch & Meyer. Wet places. Lincoln.

107. CAPPARIDACEÆ. (CAPER FAMILY.)

494. POLANISIA Raf.

1287. *Polanisia dodecandra* (Michx.) B. S. P. (*P. graveolens* Raf.) Dry, open, sandy, and stony places; common in the western part of the state. July. Long Pine; Belmont, and Cheyenne county.

1288. *Polanisia trachysperma* Torr. & Gr. Sand hills. Thedford, August 7. Like the last this frequents dry sandy places.

495. CLEOME L. Cleome.

1289. *Cleome integrifolia* Torr. & Gr. Cleome. Roadsides, etc., common. June–July. Lincoln; Nebraska City (very common); Long Pine; Weeping Water; Thedford; Belmont.

1290. *Cleome lutea* Hook. Cleome. Weeping Water. W.

496. CLEOMELLA DC.

1291. *Cleomella angustifolia* Torr. Dry, rocky places. Camp Clark, Cheyenne county, August 24.

108. RESEDACEÆ. (MIGNONETTE FAMILY.)

497. RESEDA L. Mignonette; Dyer's rocket.

1292. *Reseda* LUTEOLA L. Dyer's weed or weld. Escaped from cultivation. Weeping Water. W.

109. VIOLACEÆ. (VIOLET FAMILY.)

498. VIOLA L. Violet; heart's-ease.

1293. *Viola canadensis* L. Canada violet. Wooded canons, not common. Belmont, July 18.

1294. *Viola delphinifolia* Nutt. Larkspur violet. Prairies, common. May–July. Lincoln; Fairbury; Peru; Weeping Water.

1295. *Viola nuttallii* Pursh. Yellow prairie violet. Dry prairies. April–May. Valentine.

1296. *Viola palmata* L. Hand-leaf violet. May. Peru.

1297. *Viola palmata* L. var. *cucullata* (Ait.) Gray. (*Viola cucullata* Ait.) Common blue violet. Woods and low grounds; banks of streams, very common. April–June. Lincoln; Fairbury; Weeping Water; Peru; Crete; Long Pine.

1298. *Viola pubescens* Ait. var. *scabriuscula* Torr. & Gr. Downy yellow violet. Common in the woods of eastern Nebraska. May. Roca; Peru; Crete; Weeping Water.

110. CISTACEÆ. (ROCK-ROSE FAMILY.)

499. HELIANTHEMUM Pers. Rock-rose.

1299. *Helianthemum majus* (L.) B. S. P. (*H. canadense* Michx.) Frost-weed. Louisville. W.

111. HYPERICACEÆ. (ST. JOHN'S-WORT FAMILY.)

500. HYPERICUM L. St. John's-wort.

1300. *Hypericum perforatum* L. Common St. John's-wort. Waste places, fields, etc. June. Lincoln.

501. ASCYRUM L. St. Peter's-wort.

1301. *Ascyrum crux-andreæ* L. St. Andrew's cross. Nebraska. Gray's Manual, p. 92.)

112. ELATINACEÆ. (WATERWORT FAMILY.)

502. ELATINE L. Waterwort.

1302. *Elatine triandra* Schkuhr. Nebraska. (Coulter's Manual, and Gray's Manual, p. 92.)

113. TILIACEÆ. (LINDEN FAMILY.)

503. TILIA L. Linden; basswood.

1303. *Tilia americana* L. Basswood. Rich soil, common in eastern Nebraska. Wymore; Peru; Long Pine; Omaha; and Richardson county.

114. MALVACEÆ. (MALLOW FAMILY.)

504. HIBISCUS L. Rose-mallow.

1304. *Hibiscus militaris* Cav. Halberd-leaved rose-mallow. Wet places. Ashland, July 15. W.

1305. *Hibiscus* TRIONUM L. Bladder Ketmia. Roadsides, etc.; abundant. August–October. Dakota county; Roca. (Adv. from Europe.)

505. ABUTILON Gærtn. Indian mallow.

1306. *Abutilon* AVICENNÆ Gærtn. Velvet-leaf; button-weed; butter-weed. Waste places; too common. August. Lincoln; Weeping Water; Peru. (Adv. from India.)

506. SIDA L.

1307. *Sida* SPINOSA L. Waste places, roadsides, etc. Nemaha county, August 28.

507. MALVASTRUM Gray. False mallow.

1308. *Malvastrum coccineum* Gray. False mallow. Prairies; common. July–August. Antelope county; Hitchcock county; Fort Kearney; Fort Robinson; Broken Bow; Belmont; Thedford.

508. **MALVA** L. Mallow.

1309. *Malva* ROTUNDIFOLIA L. Common mallow. Yards, etc.; becoming common. Lincoln. Introduced.

1310. *Malva* SYLVESTRIS L. High mallow. Cass county. U.

509. **CALLIRRHOE** Nutt.

1311. *Callirrhoe alcæoides* Gray. Prairies and waste places; common. May. Lincoln; Fairbury; Weeping Water; Peru; Crete.

1312. *Callirrhoe involucrata* Gray. Prairies. July. Nelson; Hastings; Cambridge.

115. GERANIACEÆ. (GERANIUM FAMILY.)

510. **IMPATIENS** L. Balsam; jewel-weed.

1313. *Impatiens aurea* Muhl. (*I. pallida* Nutt.) Pale touch-me-not. Damp, shady places; common. August. Lincoln; Weeping Water.

1314. *Impatiens biflora* Walt. (*I. fulva* Nutt.) Spotted touch-me-not. Moist, shaded places; rare. Peru; Weeping Water; Richardson county, August 25; Dismal river in Thomas county, July 12.

511. **OXALIS** L. Wood sorrel.

1315. *Oxalis corniculata* L. var. *stricta* (L.) Sav. Yellow wood sorrel. Low prairies, moist woods, etc.; common. May–July. Otoe county; Lincoln; Weeping Water; Anselmo; Fairbury; Peru; Crete.

1316. *Oxalis violacea* L. Violet wood sorrel. Damp places; common. May. Lincoln; Fairbury; Peru; Crete; Weeping Water; Valentine; Long Pine.

116. LINACEÆ. (FLAX FAMILY.)

512. **LINUM** L. Flax.

1317. *Linum perenne* L. Dry prairies. June. Lincoln. P.

1318. *Linum perenne* L. var. *lewisii* Eat. & Wright. Nebraska. (Gray's Manual, p. 102.

1319. *Linum sulcatum* Riddell. Prairies, very common. June–July. Richardson, Fillmore, and Jefferson counties; Lincoln, Weeping Water, McCook, Crete, and Long Pine.

1320. *Linum striatum* Walt. Weeping Water. W.

117. RUTACEÆ. (RUE FAMILY.)

513. **XANTHOXYLUM** L. Prickly ash.

1321. *Xanthoxylum americanum* Mill. Northern prickly ash; toothache tree. River banks, common in eastern Nebraska. Peru; Wymore; Long Pine; Weeping Water; Nebraska City; Rulo.

118. ANACARDIACEÆ. (CASHEW FAMILY.)

514. **RHUS** L. Sumach.

1322. *Rhus aromatica* Ait. var. *trilobata* (Nutt.) Gr. High rocky ridges, common in western Nebraska. Long Pine; Valentine; Belmont; Hat Creek basin.

1323. *Rhus copallina* L. Dwarf sumach. Missouri river bottoms, common. Richardson county, August 25.

1324. *Rhus glabra* L. Smooth sumach. Open woods, banks of streams, etc., common. Lincoln; Fairbury; Crete; Peru; Brownville; Tecumseh; Beatrice; Weeping Water; Long Pine; Anselmo.

1325. *Rhus toxicodendron* L. Poison ivy; poison oak. Woods and river banks, common. Lincoln; Weeping Water; Peru; Crete; Belmont; Thedford; Anselmo.

119. SAPINDACEÆ. (SOAPBERRY FAMILY.)

515. **Staphylea** L. Bladder nut.

1326. *Staphylea trifolia* L. American bladder-nut. A bush, three to four metres (about ten or twelve feet) high. Missouri river bluffs, not uncommon. Richardson county; Cass county; Peru.

516. **Negundo** Mœnch. Box-elder.

1327. *Negundo aceroides* Mœnch. Box-elder. Along water courses, etc., common. April. Lincoln; Peru; Crete; Tecumseh; Long Pine; Weeping Water; Anselmo; Belmont; Hat Creek basin.

517. **Acer** L. Maple.

1328. *Acer dasycarpum* Ehrh. Silver maple; soft maple. Along water courses, common. April. Lincoln; Crete; Peru; Tecumseh; Weeping Water. Limited to the eastern part of the state.

1329. *Acer glabrum* Torr. Mountain maple; dwarf maple. Damp canons, common in northwestern part of the state. Hat Creek basin in Sioux county, August 1, 1889. A shrub or small tree, 2½–5 metres (8–15 feet) high.

120. POLYGALACEÆ. (MILKWORT FAMILY.)

518. **Polygala** L. Milkwort.

1330. *Polygala alba* Nutt. Prairies. Common. Belmont, July 18; Broken Bow, July 4; Anselmo, July 6; Dismal river in Thomas county, July 13.

1331. *Polygala cruciata* L. Nebraska. (Gray's Manual, p. 122.)

1332. *Polygala incarnata* L. Nebraska. (Gray's Manual, p. 121.)

1333. *Polygala verticillata* L. Dry soil, not uncommon. July–September. Crete; Weeping Water; McCook; Lincoln; Dakota county; Thomas county.

121. CELASTRACEÆ. (STAFF-TREE FAMILY.)

519. **Celastrus** L. Staff-tree; shrubby bitter-sweet.

1334. *Celastrus scandens* L. Wax-work; climbing bitter-sweet. Banks of streams, common. Lincoln; Peru; Crete; Weeping Water; Long Pine; Belmont.

520. **Euonymus** L. Spindle-tree.

1335. *Euonymus americanus* L. Strawberry bush. Weeping Water. W.

1336. *Euonymus americanus* L. var. *obovatus* Torr. & Gr. Weeping Water. W.

1337. *Euonymus atropurpureus* Jacq. Burning-bush; waahoo. Woods, common. June. Lincoln; Weeping Water; Crete; Peru.

122. RHAMNACEÆ. (BUCKTHORN FAMILY.)

521. **Ceanothus** L. New Jersey tea; red-root.

1338. *Ceanothus americanus* L. New Jersey tea. Prairies, common. June–July. Peru; Lincoln; Long Pine; Fairbury; Weeping Water.

1339. *Ceanothus ovatus* Desf. (Includes *C. ovalis* Bigel.) Red-root. Prairies, common. May–June. Lincoln; Weeping Water; Peru; Crete; Thedford; Anselmo.

522. **Rhamnus** L. Buckthorn.

1340. *Rhamnus alnifolia* L'Her. Nebraska. (Gray's Manual, p. 111.)

1341. *Rhamnus caroliniana* Walt. (*Frangula caroliniana* Gray.) Alder buckthorn. Ashland; Weeping Water.

1342. *Rhamnus lanceolatus* Pursh. Buckthorn. Wymore; Weeping Water.

123. AMPELIDEÆ. (VINE FAMILY.)

523. PARTHENOCISSUS Planch. Virginia creeper.

1343. *Parthenocissus quinquefolia* (L.) Planch. (*Ampelopsis quinquefolia* Michx. *Vitis quinquefolia* Lam.) Five-leaved ivy. Woods, etc. Lincoln; Weeping Water; Crete; Belmont; Anselmo.

524. VITIS L. Grape.

1344. *Vitis cordifolia* Michx. Nebraska. (Gray's Manual, p. 113.)

1345. *Vitis riparia* Michx. Wild grape. Wooded banks, etc. Peru; Crete; Weeping Water; Belmont; Anselmo.

1346. *Vitis æstivalis* Michx. Summer grape. Weeping Water. W.

124. EUPHORBIÆ. (SPURGE FAMILY.)

525. ACALYPHA L. Three-seeded mercury.

1347. *Acalypha virginica* L. Three-seeded mercury. Moist woods, etc.; common. August. Lincoln.

526. CROTON L. Croton.

1348. *Croton texensis* Muell. Prairies; common. July–August. Fort Robinson; Long Pine; Anselmo; Belmont; Broken Bow; Thedford.

527. EUPHORBIA L. Spurge.

1349. *Euphorbia corollata* L. Prairies and roadsides; common. July–August. Lincoln; Peru; Weeping Water; Saunders county.

1350. *Euphorbia* CYPARISSIAS L. Escaped in places. Crete, July 4.

1351. *Euphorbia dentata* Michx. Low grounds; not uncommon. October. Lincon.

1352. *Euphorbia dictyosperma* Fisch. & Meyer. Prairies. Fairbury; Lincoln.

1353. *Euphorbia flagelliformis* Engelm. July–August. Fort Robinson; Valentine. U.

1354. *Euphorbia glyptosperma* Engelm. Prairies. Fairbury; Weeping Water; Lincoln.

1355. *Euphorbia hexagona* Nutt. Dry places; not uncommon. Douglas county; Norfolk; Alliance; Belmont.

1356. *Euphorbia heterophylla* L. Open woods, rare. Lincoln; Crete; Weeping Water.

1357. *Euphorbia humistrata* Engelm. Yards, etc., Lincoln; Weeping Water.

1358. *Euphorbia hypericifolia* L. Open woods, etc.; common. Lincoln; Crete; Weeping Water; Saunders county.

1359. *Euphorbia maculata* L. Prairies and waste places; common. Lincoln; Weeping Water; Seward county; Saunders county.

1360. *Euphorbia marginata* Pursh. Snow-on-the-mountain. Prairies and waste places; very common. July–August. Peru; Lincoln; Weeping Water; Anselmo.

1361. *Euphorbia montana* Engelm. Usually in high, rocky places. July–August. Fort Robinson; Belmont; Hat Creek basin.

1362. *Euphorbia obtusata* Pursh. Low prairies, rare. Lincoln.

1363. *Euphorbia petaloidea* Engelm. Prairies; common westward. Schuyler; Kearney; Louisville; Anselmo; Belmont.

1364. *Euphorbia serpyllifolia* Pers. Fort Robinson. July. B.

125. UMBELLIFERÆ. (PARSLEY FAMILY.

528. CRYPTOTÆNIA DC. Honewort.

1365. *Cryptotænia canadensis* (L.) DC. Thickets; common. July. Lincoln; Crete; Weeping Water.

529. CICUTA L. Water hemlock.

1366. *Cicuta maculata* L. Spotted cowbane; musquash root; beaver poison. Wet places, common. August. Lincoln; Crete; Weeping Water.

530. ZIZIA Koch.

1367. *Zizia aurea* Koch. (*Thaspium aureum* var. *apterum* Gray.) Meadow parsnip. Damp woods. May. Weeping Water.

531. OSMORRHIZA Raf. Sweet cicely.

1368. *Osmorrhiza longistylis* (Torr.) DC. Smoother sweet cicely. Wooded banks, and canons, common. May–July. Milford; Weeping Water; Peru; Belmont; Anselmo; Dismal river in Thomas county.

532. MUSENIUM Nutt.

1369. *Musenium tenuifolium* Nutt. High rocky ridges, common. Hat Creek basin, Sioux county, August 2; Belmont, July 25; Cheyenne county, August 7.

533. APIASTRUM Nutt.

1370. *Apiastrum patens* (Nutt.) Coulter & Rose. (*Apium patens* of Watson's Index.) Sandy soil. June. U.

534. SANICULA L. Sanicle.

1371. *Sanicula canadensis* L. Black snake-root. Woods, common. July. Douglas county; Lincoln; Long Pine; Weeping Water; Belmont; Hat Creek basin in Sioux county.

1372. *Sanicula marylandica* L. Black snake-root. Open woods, common, May–June. Weeping Water; Peru; Crete.

535. THASPIUM Nutt. Meadow parsnip.

1373. *Thaspium barbinode* (Michx.) Nutt. Meadow parsnip. Prairies, rare. June. Lincoln.

536. CYMOPTERUS Raf.

1374. *Cymopterus montanus* Torr & Gr. Valentine. May. U. (Also according to Gray's Manual, p. 204.)

537. PUCEDANUM L.

1375. *Pucedanum fœniculaceum* Nutt. Prairies, early spring, very common. April–May. Lincoln; Fairbury; Crete; Wymore; Weeping Water; South Bend.

1376. *Pucedanum nudicaule* Nutt. Prairies. Valentine; McCook; Beaver City.

1377. *Pucedanum villosum* Nutt. Nebraska. (Coulter's Manual.)

538. POLYTÆNIA DC.

1378. *Polytænia nuttallii* DC. Prairies, etc. Lincoln, August.

539. HERACLEUM L. Cow parsnip.

1379. *Heracleum lanatum* Michx. Cow parsnip. Damp wooded canons. Belmont; Long Pine.

126. CORNACEÆ. (DOGWOOD FAMILY.)

540. CORNUS L. Cornel; dogwood.

1380. *Cornus asperifolia* Michx. Rough-leaved dogwood. Banks of streams. June. Lincoln; Crete; Weeping Water.

1381. *Cornus candidissima* Marsh. (*C. paniculata* L'Her.) White-fruited dogwood. Weeping Water. W.

1382. *Cornus sericea* L. Silky cornel; kinnikinnik. Peru; Weeping Water.

1383. *Cornus stolonifer* Michx. Red osier dogwood. Canons, common. Long Pine; Weeping Water.

127. CRASSULACEÆ. (ORPINE FAMILY.)

541. PENTHORUM L. Ditch stone-crop.

1384. *Penthorum sedoides* L. Ditch stone-crop. Banks of streams, common. July. Lincoln; Weeping Water.

542. SEDUM L. Stone-crop; orpine.

1385. *Sedum stenopetalum* Pursh. High, rocky ridges, not common. Hat Creek basin, in Sioux county, August 2.

128. SAXIFRAGACEÆ. (SAXIFRAGE FAMILY.)

543. RIBES L. Currant; gooseberry.

1386. *Ribes aureum* Pursh. Buffalo, or Missouri currant. May–June. Valentine; Long Pine; Anselmo; Belmont.

1387. *Ribes cynosbati* L. Prickly gooseberry. Antelope county. (Herb. E. R. McGee.)

1388. *Ribes cereum* Dougl. Squaw currant. Rocky bluffs, common in the northwestern part of the state. Belmont; Hat Creek basin.

1389. *Ribes floridum* L'Her. Wild black currant. Wooded banks of streams, common. Antelope county; Belmont; Anselmo; Dismal river, in Thomas county.

1390. *Ribes rotundifolium* Michx. Common wild gooseberry. Banks of streams, common. May. Peru; Crete; Tecumseh; Weeping Water; Belmont.

1391. *Ribes rubrum* L. Red currant. Weeping Water. W.

544. HEUCHERA L. Alum root.

1392. *Heuchera hispida* Pursh. May–July. Ashland; Belmont.

129 HAMAMELACEÆ. (WITCH-HAZEL FAMILY.)

545. HAMAMELIS L. Witch-hazel.

1393. *Hamamelis virginica* L. Damp woods. Weeping Water. W.

130. CACTACEÆ. (CACTUS FAMILY.)

546. OPUNTIA Tourn.

1394. *Opuntia fragilis* Haw. On high, rocky prairies. Long Pine; Belmont.

1395. *Opuntia missouriensis* DC. Dry, rocky hills, sand hills, etc., common. Weeping Water; Long Pine; Chadron; Belmont; Thedford.

1396. *Opuntia rafinesquii* Engelm. Rocky prairies. Belmont; Long Pine.

547. MAMILLARIA Haw.

1397. *Mamillaria vivipara* Haw. Sand hills. Whitman; Thedford; Belmont.

131. LOASACEÆ. (LOASA FAMILY.)

548. MENTZELIA L.

1398. *Mentzelia lævicaulis* Torr. & Gr. Prairies. July–September. Box Butte county; Fort Robinson; Belmont; Alliance.

1399. *Mentzelia ornata* Torr. & Gr. Prairies and barren places in "bad lands." Belmont; Chadron; Hat Creek basin.

132. ONAGRACEÆ. (EVENING-PRIMROSE FAMILY.)

549. CIRCÆA L. Enchanter's nightshade.

1400. *Circæa lutetiana* L. Damp, shaded places, rather uncommon. Long Pine; Dismal river in Thomas county, July 13, 1889.

550. GAURA L. Gaura.

1401. *Gaura biennis* L. Roadsides and waste places. Common. August. Lincoln, Peru; Crete; Weeping Water; Seward.

1402. *Gaura coccinea* Nutt. Roadsides and prairies. Not uncommon in western and central regions. Fort Robinson; Lincoln; Nelson; Hardy; Cheyenne county; Broken Bow; Belmont; Thedford; Hat Creek basin.

1403. *Gaura parviflora* Dougl. Roadsides and prairies, common. July–August. Lincoln; Weeping Water; Crawford.

551. ŒNOTHERA L. Evening primrose.

1404. *Œnothera albicaulis* Nutt. White stemmed evening primrose. Prairies, common. Fort Robinson; Long Pine; Alliance, July 14; Belmont, July 24; Hat Creek basin, August 1. Very variable. A smooth stemmed form is perhaps the most common. There is also a puberulent form and a sinnate-leaved puberulent form that are by no means uncommon.

1405. *Œnothera biennis* L. Common evening primrose, Waste places, common. July-September. Lincoln; Weeping Water; Peru; Hastings; Long Pine; Tecumseh; Dismal river in Thomas county; Hat Creek basin; Belmont.

1406. *Œnothera cæspitosa* Nutt. Denuded places in "bad lands." Rare. Hat Creek basin, August 1.

1407. *Œnothera canescens* Torr. Cheyenne county. W.

1408. *Œnothera coronopifolia* Torr. & Gr. Prairies. Belmont, July 24; Hat Creek basin, August 1; Alliance, July 14.

1409. *Œnothera missouriensis* Sims. In rocky grounds. Holmesville, July. Abundant in old magnesium limestone quarry. White roots, fleshy, two feet long.

1410 *Œnothera pinnatifida* Nutt. In bunches on prairie. Red Willow county; Cheyenne county. U.

1411. *Œnothera rhombipetala* Nutt. Long Pine; prairies. B.

1412. *Œnothera sinuata* L. Prairies. May–August. Thedford; Fairbury; Crete; Hastings.

1413. *Œnothera serrulata* Nutt. Prairies, very common. June–August. Lincoln; Aurora; Peru; Diller; Crete; Nelson; Fairbury; Anselmo; Thedford; Belmont; Hat Creek basin, and Antelope county.

1414. *Œnothera triloba* Nutt. var. *parviflora* Watson. Nebraska. (Coulter's Manual, p. 104.)

552. LUDWIGIA L. False loosestrife.

1415. *Ludwigia palustris* (L.) Ell. Louisville, August.

1415½. *Ludwigia polycarpa* Short & Peter. Edges of ponds, common. Lincoln.

553. EPILOBIUM L. Willow herb.

1416. *Epilobium coloratum* Muhl. July. Weeping Water; Anselmo; Thedford; Belmont; Hat Creek basin.

1416½. *Epilobium adenocaulon* Haussk. Canons of Pine Ridge; Belmont; July 25.

1417. *Epilobium lineare* Muhl. Wet places, rare. Thedford, August 7.

1418. *Epilobium spicatum* Lam. Damp wooded canons, rare. Belmont, July 20.

133. HALORAGEÆ. (WATER MILFOIL FAMILY.)

554. MYRIOPHYLLUM L.

1419. *Myriophyllum pinnatum* (Walt.) B. S. P. (*M. scabrum* Michx.) Water milfoil. Fresh water ponds. July. Lincoln.

134. LYTHRACEÆ. (LOOSESTRIFE FAMILY.)

555. **LYTHRUM** L. Loosestrife.

1420. *Lythrum alatum* Pursh. Loosestrife. Low grounds, common. July. Lincoln; Long Pine; Anselmo; Thedford.

556. **AMMANIA** L.

1421. *Ammania coccinea* Rottb. (*A. latifolia* Gr., not L.) Low, wet grounds, common. July. Lincoln.

1422. *Ammania ramosior* L. (*A. humilis* Michx.) Low wet places. Lincoln.

135. ELÆAGNACEÆ. (OLEASTER FAMILY.)

557. **SHEPHERDIA** Nutt. Buffalo berry.

1423. *Shepherdia argentea* Nutt. Buffalo berry. Hills and bluffs. A thorny bush. Valentine; Long Pine; Broken Bow; Anselmo; Crawford; Dismal river in Thomas county. Very common.

136. ROSACEÆ. (ROSE FAMILY.)

558. **AMELANCHIER** Lindl. June-berry; service berry; shad-bush.

1424. *Amelanchier alnifolia* Nutt. June-berry. Canons, not common. Hat Creek basin, August 1; Belmont, July 24; Long Pine.

1425. *Amelanchier canadensis* (L.) Medicus. var. *botryapium* (Willd.) Gray. June berry; service berry. April–June. Peru; Nebraska City.

559. **CRATÆGUS** L. Hawthorn; white thorn.

1426. *Cratægus tomentosa* L. Black, or pear thorn. Wooded banks. April. Omaha; Brownville.

560. **PYRUS** L. Pear; apple.

1427. *Pyrus coronaria* L. American crab apple. Wooded bluffs. Peru.

561. **ROSA** L. Rose.

1428. *Rosa arkansana* Porter. Prairies and woods, very common. June–August. Antelope county; Lincoln; Long Pine; Crete; Weeping Water; Belmont; Broken Bow; Anselmo; and Dismal river, in Thomas county. Distinguished from its near relatives with infrastipular spines (*R. blanda* and *R. sayi*) by its narrow glandular-toothed stipules, 7–11 leaflets, lobed outer sepals, and more prickly stem. It is the most common rose in Nebraska, varying from 15–180 cm. (½–6 ft.) in height. My Broken Bow specimens differ somewhat from the type, being but slightly prickly and having somewhat dilated stipules, otherwise typical. They are probably merely a form.

1429. *Rosa blanda* Ait. Early. Early wild rose. Prairies and fields. May. Fairbury. U.

1430. *Rosa fendleri* Crepin. In wooded canons. Belmont, July 18. Very rank, fully 2½ metres (8 feet) high.

1431. *Rosa setigera* Michx. Climbing, or prairie rose. Wooded bottoms of the Missouri river, common. Richardson county, August 25, (in fruit). Bush somewhat climbing, from 1.2–2.1 metres (4–7 feet) high. The common name — prairie rose — from observations in Nebraska, is a faulty designation.

1432. *Rosa woodsii* Lindl. In ravines and on prairies. Fort Robinson, July; Belmont, July 27; Hat Creek basin, August 1. Apparently the most common rose in northwest Nebraska, in and on the outskirts of the "bad lands" ("Nebraska, on White river, Smith's Fork, and in the 'bad lands.'"—Hayden.) Distinguished from *R. fendleri* and other related species with persistent sepals and infrastipular spines by having the outer sepals latterly lobed. The fruits and sepals, so far as I have been able to observe them, are lighter colored than in other Nebraska species, being usually orange yellow, with merely a pinkish tinge.

562. POTERIUM L. Burnet.

1433. *Poterium* SANGUISORBA L. Garden burnet. Escaped. Lincoln.

563. AGRIMONIA L. Agrimony.

1434. *Agrimonia eupatoria* L. Common agrimony. Borders of woods; not uncommon. July–August. Lincoln; Weeping Water; Belmont; Hat Creek basin.

564. POTENTILLA L. Five-finger.

1435. *Potentilla arguta* Pursh. Low prairies, banks of streams, etc. June–July. Weeping Water; Lincoln; Broken Bow.

1436. *Potentilla canadensis* L. var. *simplex* (Michx.) T. & G. Weeping Water.

1437. *Potentilla hippiana* Lehm. High prairies; common in western Nebraska. Belmont, July 18; Hat Creek basin, August 2.

1438. *Potentilla norvegica* L. Woods and waste places; common. July–August. Dakota county; Lincoln; Weeping Water; Anselmo; Belmont.

1439. *Potentilla pennsylvanica* L. Weeping Water and prairies of Loup River valley; Thedford, July 14.

1440. *Potentilla rivalis* Nutt. Low grounds; common. July. Lincoln; Weeping Water; Peru.

1441. *Potentilla rivalis* Nutt. var. *millegrana* (Engelm.) Watson. Weeping Water; Louisville. W.

565. FRAGARIA L. Strawberry.

1442. *Fragaria vesca.* Wild strawberry. Wooded banks and canons; common in central and western Nebraska. Long Pine, July; Belmont, July 18; Hat Creek basin, August 2; Anselmo, July 6; Dismal river in Thomas county, July 12.

1443. *Fragaria virginiana* Duchesne, var. *illinoensis* Gray. Common wild strawberry. Wooded banks, prairies, waste places, etc.; common. May–June. Lincoln; Weeping Water; Peru; Crete; Long Pine; Chadron.

566. GEUM L. Avens.

1444. *Geum album* Gmel. Avens. In woods; common. July–August. Lincoln; Peru; Anselmo.

1445. *Geum strictum* Ait. Yellow avens. Woods in canons. Belmont, July 18; Dismal river, July 12; Long Pine, July.

1446. *Geum virginianum* L. Avens. Weeping Water. W.

567. RUBUS L. Raspberry; blackberry.

1447. *Rubus occidentalis* L. Black raspberry; thimbleberry. Woods. May. Peru; Crete.

1448. *Rubus strigosus* Michx. Wild red raspberry. Thickets, etc., common. June–July. Lincoln; Weeping Water, Peru; Anselmo, and Dismal river in Thomas county.

1449. *Rubus villosus* Ait. Common or high blackberry. In eastern part of state. B.

568. NIELLIA Don. Nine-bark.

1450. *Niellia opulifolia* (L.) Benth. & Hook. In canons. Long Pine. B.

569. PRUNUS L. Plum; cherry.

1451. *Prunus americana* Marshall. Wild yellow or red plum. Banks of creeks, etc., common. April–May. Lincoln; Weeping Water; Peru; Valentine; Crete.

1452. *Prunus demissa* Walpers. Wild cherry. In "draws" along water courses, etc., common. Probably throughout central and western Nebraska. Belmont, July 25; Anselmo, July 6; Dismal river, Thomas county, July 12; Long Pine; Valentine. A small leafy tree from 1–3 metres (3–10 ft.) high. Easily recognized by two dark glands that occur at the base of the leaf. A prolific bearer, fruits ripening in August.

1453. *Prunus pumila* L. Sand cherry; dwarf cherry. Dry sandy or usually somewhat barren unoccupied ground. Sand hills of central Nebraska and growing from crevices between rocks in the "bad lands." May. Antelope county; Pierce; Valentine; Anselmo; Thedford; Alliance; Hat Creek basin. The largest and juiciest of our wild cherries. The fruits are very commonly used by the settlers on their tables. An attempt at cultivation would, I think, be well rewarded, especially in our sandy, central, and barren northwestern regions. The fruits are frequently injured by the little white larva of a snout beetle or sand cherry gouger (*Coccotorus scutellaris* Lec.), which works in the stone.

1454. *Prunus serotina* Ehrh. Wild black cherry. Peru; Weeping Water.

1455. *Prunus virginiana* L. Choke cherry. Rich woods. May. Lincoln; Peru; Weeping Water; Crete.

137. LEGUMINOSÆ. (PULSE FAMILY.)

570. SCHRANKIA Willd.

1456. *Schrankia uncinata* Willd. Sensitive brier. Prairies, not uncommon Cambridge; Peru; Fairbury; Harlan county.

571. DESMANTHUS Willd. Desmanthus.

1457. *Desmanthus brachylobus* (DC.) Benth. Roadsides, not very common. July. Lincoln; Brownville.

572. CERCIS L. Red bud; Judas tree.

1458. *Cercis canadensis* L. Red bud. Wooded banks, common. Peru; Weeping Water; Wymore; Nemaha City; Rulo.

573. CASSIA L. Senna.

1459. *Cassia chamæcrista* L. Partridge pea; wild sensitive plant. Very common in waste places, roadsides, etc. July–September. Lincoln; Peru; Tecumseh; Crete; Weeping Water.

1460. *Cassia marilandica* L. Wild senna. Roadsides, rare. July. Lincoln; Peru.

574. GLEDITSCHIA L.

1461. *Gleditschia triacanthos* L. Three-thorned acacia, or honey locust. Banks of streams. May–June. Lincoln; Weeping Water; Tecumseh; Crete.

575. GYMNOCLADUS Lam. Kentucky coffee tree.

1462. *Gymnocladus canadensis* Lam. Wooded banks of streams, common. Saltillo; Rulo; Nemaha City; West Point.

576. SOPHORA L.

1463. *Sophora sericea* Nutt. Prairies. June–July. Cambridge; McCook; and Red Willow county.

577. PHASEOLUS L. Kidney bean.

1464. *Phaseolus angulosus* (Muhl.) Ort. (*P. diversifolius* Pers.) Wild bean. Banks of streams, common. July–August. Lincoln; Louisville; Weeping Water; Peru; Seward county.

1465. *Phaseolus pauciflorus* Benth. River banks, not uncommon. July–September. Lincoln.

1466. *Phaseolus polystachyus* (L.) B. S. P. (*P. perennis* Walt.) Weeping Water. W.

578. GALACTIA P. Br. Milk pea.

1467. *Galactia pilosa* Ell. (*G. mollis* Gray, not Michx.) Weeping Water. W.

579. APIOS Mœnch.

1468. *Apios tuberosa* Mœnch. Ground nut; wild bean. River banks, becoming common. July–August. Crete; Peru; Rulo; Weeping Water; Lincoln.

580. AMPHICARPÆA Ell.

1469. *Amphicarpæa comosa* (L.) Ridd. (*A. monoica* Ell.) Hog peanut. Damp woods, common. July–August. Lincoln; Peru; Weeping Water.

581. LATHYRUS L.

1470. *Lathyrus polymorphus* Nutt. Everlasting pea. Prairies, etc. May–July. West Point; Pierce; Fort Robinson; Valentine; Broken Bow; Anselmo; Belmont; Thedford, and Antelope county.

582. VICIA L. Vetch; tare.

1471. *Vicia americana* Muhl. Common vetch. Roadsides, etc., common. May–June. Weeping Water; Nebraska City.

1472. *Vicia americana* Muhl. var. *linearis* (Nutt.) Watson. Prairies, common (more common than the type). May–June. Lincoln; Fairbury; Gordon; Crete; Weeping Water, and Antelope county.

1473. *Vicia americana* Muhl. var. *truncata* (Nutt.) Brewer. Peru; Weeping Water.

583. LESPEDEZA Michx. Bush clover.

1474. *Lespedeza frutescens* (Willd.) Ell. (*L. capitata* Michx.) Bush clover Prairies, common. August–September. Lincoln; Tecumseh; Weeping Water; Nemaha City.

584. DESMODIUM Desv. Tick-trefoil.

1475. *Desmodium canadense* (L.) DC. Tick-trefoil. Prairies and waste places, common. July–October. Weeping Water; Peru; Tecumseh; Lincoln; Broken Bow; Thedford.

1476. *Desmodium canescens* (L.) DC. Tick-trefoil. Weeping Water; Lincoln.

1477. *Desmodium grandiflorum* (Walt.) DC. (*D. acuminatum* DC.) Tick-trefoil. Damp woods, rather common. July. Lincoln; Crete; Weeping Water.

1478. *Desmodium dillenii* Darl. Tick-trefoil. Weeping Water. W.

1479. *Desmodium rigidum* (Ell.) DC. Tick-trefoil. Roadsides. Lincoln; Weeping Water.

1480. *Desmodium paniculatum* (L.) DC. Wooded bluffs of the Missouri river Richardson county, August 25.

585. GLYCYRRHIZA L. Liquorice.

1481. *Glycyrrhiza lepidota* Pursh. Wild liquorice. Prairies, very commo July–August. Lincoln; Crete; Weeping Water; Anselmo; Thedfor Belmont; Hat Creek basin.

586. OXYTROPIS DC.

1482. *Oxytropis lamberti* Pursh. Prairies, common. Harvard; Gordon; Ke esaw; McCook; Broken Bow; Belmont; Antelope and Hitchcoc counties.

1483. *Oxytropis lamberti* Pursh. var. *sericea* Gray. Belmont, July 18. (A specimen in fruit seems to be this variety.)

1484. *Oxytropis podocarpa* Gray. Prairies, rare. Thedford; Thomas county, July 14.

587. ASTRAGALUS L. Rattle-weed.

1485. *Astragalus adsurgens* Pall. Prairies, not very common. Belmont, July 24.

1486. *Astragalus bisulcatus* Gray. Nebraska. (Coulter's Manual.)

1487. *Astragalus cæspitosus* Gray. High prairies, common. Hat Creek basin, August 2; Belmont, July 24. Forming dense cæspitose masses on high rocky places. Leaves simple, sericeous, scapes slightly exceeding the leaves. Differs from *A. simplicifolius* Gray, in its longer leaves and scapes.

1488. *Astragalus canadensis* L. Prairies and edges of woods, common. July–September. Peru; Lincoln; Weeping Water; Belmont.

1489. *Astragalus caryocarpus* Ker. Ground plum; buffalo pea. Prairies, very common. April–July. Fairbury; Crete; Lincoln; Weeping Water; Valentine; Belmont.

1490. *Astragalus drummondii* Dougl. Common on prairies, forming erect bushy clumps. Belmont, July 27, (in fruit).

1491. *Astragalus flexuosus* Dougl. Nebraska. (Coulter's Manual, p. 67.)

1492. *Astragalus hypoglottis* L. Prairies, etc. Belmont, July 24. (In flower and fruit.)

1493. *Astragalus kentrophyta* Gray. Dry, almost barren, ground in open canons. Belmont, July 21.

1494. *Astragalus lotiflorus* Hook. Nebraska. (Coulter's Manual, p. 63.)

1495. *Astragalus gracilis* Nutt. Sandy prairies, not uncommon. June–July. Red Willow county; Fort Robinson; Anselmo, and Dismal river in Thomas county.

1496. *Astragalus mexicana ?* A. DC. Prairies. Belmont, July 27.

1497. *Astragalus microlobus* Gray. Nebraska. (Coulter's Manual, p. 62.)

1498. *Astragalus missouriensis* Nutt. Nebraska. (Coulter's Manual, p. 64.)

1499. *Astragalus mollissimus* Torr. Common loco. Prairies, common westward. Harvard; Cambridge; Dwight; McCook; Brule; Alliance; Crawford.

1500. *Astragalus multiflorus* Gray. In barren gulches of the "bad lands." Hat Creek basin, August 2.

1501. *Astragalus pectinatus* Dougl. Nebraska. (Coulter's Manual, p. 67.)

1502. *Astragalus pictus* Gray. Bird-egg pea. Sand hills, common in central Nebraska. Anselmo, July 8; Dismal river in Thomas county, July 13. Pod ovoid, large, inflated, beautifully mottled with reddish purple and straw color.

1503. *Astragalus plattensis* Nutt. Prairies, rare. April–May. Lincoln; Belmont, July 18. (In fruit.)

1504. *Astragalus racemosus* Pursh. Nebraska. (Coulter's Manual, p. 62.)

1505. *Astragalus sericoleucus* Gray. Edges of rocky bluffs, etc., common. Belmont, July 21; Cheyenne county, May. Its leafy stems form whitish cushions, against which the deep blue flowers form a pleasing contrast.

1506. *Astragalus shortianus* Nutt. Prairies. May–June. Valentine; Red Willow county.

1507. *Astragalus triphyllus* Pursh. Prairies. Belmont, July 25.

588. ROBINIA L. Locust tree.

1508. *Robinia pseudacacia* L. Common locust; false acacia. Escaped alon
streams. May. Lincoln; Peru.

589. PETALOSTEMON Michx. Prairie clover.

1509. *Petalostemon candidus* Michx. White prairie clover. Prairies; con
mon. Lincoln; Fairbury; Peru; Tecumseh; Crete; Weeping Wate
Broken Bow; Hat Creek basin.

1510. *Petalostemon violaceus* Michx. Purple prairie clover. Prairies; con
mon. July–August. Fairbury; Lincoln; Peru; Crete; Long Pin
Weeping Water; Anselmo; Dakota county.

1511. *Petalostemon villosus* Michx. Villose prairie clover. Sandy prairies
common. July–August. Valley Junction; Ewing; Anselmo; A
liance; Thedford.

590. DALEA L. Dalea.

1512. *Dalea alopecuroides* Willd. Prairies; common. July–August. Li
coln; Seward county.

1513. *Dalea aurea* Nutt. Prairies. July. Valentine. B.

1514. *Dalea lanata* Spreng. Nebraska. (Coulter's Manual, p. 58.)

1515. *Dalea laxiflora* Pursh. Prairies; common. Nelson; Long Pine; M
Cook; Kearney; Broken Bow; Phelps county.

591. AMORPHA L. False indigo; lead plant.

1516. *Amorpha canescens* Nutt. Lead plant. Prairies; very common. June
September. Lincoln; Crete; Peru; Weeping Water; Fort Robinson
Anselmo; Thedford.

1517. *Amorpha fruticosa* L. False indigo. River banks; common. June
July. Lincoln; Crete; Weeping Water; Valentine.

592. PSORALEA L. Psoralea.

1518. *Psoralea argophylla* Pursh. Silver leaf. Prairies; common. June
July. Lincoln; Weeping Water; Crete; Hastings; Belmont; An
selmo.

1519. *Psoralea campestris* Nutt. Sandy prairies; common westward. July
Fort Robinson; Anselmo; Dismal river in Thomas county; Hat Cree
basin in Sioux county; Antelope county.

1520. *Psoralea esculenta* Pursh. *Pomme blanche* or *Pomme de prairie*. Pra
ries; common. Lincoln; Gordon; Crete; Cambridge; Hardy; Weep
ing Water; Valentine; Belmont.

1521. *Psoralea lanceolata* Pursh. Prairies; common westward. July–Au
gust. Antelope county; Fort Robinson; Anselmo; Thedford; Be
mont; Hat Creek basin.

1522. *Psoralea tenuiflora* Pursh. (*P. floribunda* Nutt.) Prairies; everywhe
common. June–August. Lincoln; Fairbury; Weeping Wate
Crete; Chadron; Broken Bow.

593. HOSACKIA Douglas.

1523. *Hosackia purshiana* Benth. Quite common on low prairies. July
August. Lincoln; Crete; Aurora; Anselmo; Broken Bow; Belmon

594. TRIFOLIUM L. Clover; trefoil.

1524. *Trifolium* PRATENSE L. Red clover. Escaped to roadsides and wa
places. June–August. Lincoln; Peru; Crete; Weeping Wat
Furnas county. The zigzag clover (*T. medium* L.) undoubtedly occ
frequently as an escape also, but specimens have not been gather

1525. *Trifolium* REPENS L. White clover. Introduced. Waste places, co
mon. Lincoln; Peru; Weeping Water; Crete.

1526. *Trifolium reflexum* L. Buffalo clover. Weeping Water. W.

1527. *Trifolium stoloniferum* Muhl. Running buffalo clover. Waste places. Lincoln; Louisville. W.

595. **MELILOTUS** Juss. Sweet clover; melitot.

1528. *Melilotus* ALBA Lam. White melitot. Waste grounds. July–August. Lincoln; Crete; Dakota county.

1529. *Melilotus* OFFICINALIS (L.) Lam. Yellow melitot. Waste places near dwellings, common. June. Lincoln; Weeping Water.

596. **MEDICAGO** L. Medick.

1530. *Medicago* LUPULINA L. Waste places. May–July. Escaped. Lincoln.

1531. *Medicago* MACULATA Willd. Escaped to waste places. Weeping Water.

1532. *Medicago* SATIVA L. Lucerne; "alfalfa." Waste places. July. Escaped. Lincoln; Weeping Water; Furnas county.

597. **LUPINUS** L. Lupine.

1533. *Lupinus plattensis* Watson. Prairies, etc., common in the western part of the state. July–August. Belmont; Hat creek basin; Fort Robinson.

598. **CROTALARIA** L. Rattle-box.

1534. *Crotalaria sagittalis* L. Rattle-box. July–August. Waste places. Peru; Dakota county.

599. **BAPTISIA** Vent. False indigo.

1535. *Baptisia leucantha* Torr. & Gr. Low prairies, not common. July. Lincoln; Crete; Weeping Water.

1536. *Baptisia leucophæa* Nutt Yellow false indigo. Low prairies, common. May–June. Lincoln; Crete; Fairbury; Peru; Weeping Water.

600. **THERMOPSIS** R. Br.

1537. *Thermopsis rhombifolia* Richardson. High prairies, rocky ridges, etc., not uncommon. Belmont; North Platte; Valentine. Pods very long, 5–7½ cm. (2–3 in.); variously much curved.

138. SANTALACEÆ. (SANDALWOOD FAMILY.)

601. **COMANDRA** Nutt. Bastard toad-flax.

1538. *Comandra pallida* A. DC. High prairies, or rocky ridges, not uncommon in the western part of the state. Dismal river, in Thomas county; Belmont; Hat Creek basin.

1539. *Comandra umbellata* (L.) Nutt. Common bastard toad-flax. Rocky wood hills, dry prairies, etc.; common. May–June. Weeping Water; Lincoln; Valentine.

139. PRIMULACEÆ. (PRIMROSE FAMILY.)

602. **GLAUX** Tourn. Sea milkwort.

1540. *Glaux maritima* L. Nebraska. (Gray's Manual, p. 331.)

603. **STEIRONEMA** Raf. Loosestrife.

1541. *Steironema ciliatum* (L.) Raf. (*Lysimachia ciliata* L.) Loosestrife. Low grounds, common. July–August. Lincoln; Peru; Crete; Weeping Water.

1542. *Steironema lanceolatum* (Walt.) Gray. (*Lysimachia lanceolata* Walt.) Loosestrife. Nebraska. (Coulter's Manual.)

604. **ANDROSACE** Tourn.

1543. *Androsace occidentalis* Pursh. Low grounds, prairies, common. May–June. Lincoln; Fairbury; Weeping Water.

140. CONVOLVULACEÆ. (CONVOLVULUS FAMILY.)

605. CUSCUTA L. Dodder; love-vine.

1544. *Cuscuta arvensis* Beyrich. On *Polygonum* and various low plants. August. Lincoln; Fort Robinson.

1545. *Cuscuta chlorocarpa* Engelm. On *Monarda*, *Polygonum*, *Ribes*, *Salix*, etc. August. Lincoln; Weeping Water.

1546. *Cuscuta cuspidata* Engelm. On *Ambrosia*, *Helianthus* and various *compositæ* and *Leguminosæ*. Common. July–August. Lincoln; Long Pine; Weeping Water.

1547. *Cuscuta glomerata* Choisy. On various weeds, common. Lincoln; Crete; Weeping Water.

1548. *Cuscuta decora* Choisy. Weeping Water. W.

1549. *Cuscuta gronovii* Willd. On *Ambrosia*, *Helianthus*, and various large weeds. Lincoln.

1550. *Cuscuta inflexa* Engelm. Nebraska. (Gray's Manual, p. 372.)

606. EVOLVULUS L.

1551. *Evolvulus argenteus* Pursh. Prairies, rare. Kearney county.

607. CONVOLVULUS L. Bindweed.

1552. *Convolvulus incanus* Vahl. Waste places, rare. Lincoln.

1553. *Convolvulus sepium* L. (*Calystegia sepium* A. Br. in part.) Hedge bindweed. Cultivated fields, too common. July–August. Lincoln; Crete; Weeping Water.

1554. *Convolvulus sepium* L. var. *repens* (L.) Gray (var. *pubescens* Gray). Fairbury; Lincoln. U.

608. IPOMŒA L. Morning glory.

1555. *Ipomœa* HEDERACEA Jacq. Morning glory. In the older settled portions of the state this has escaped to roadsides and fields. Richardson county, August 26.

1556. *Ipomœa leptophylla* Torr. Bush morning glory. Prairies, common in central and western Nebraska. July. Box Butte county; Long Pine; Belmont; Hat Creek basin, and Dismal river in Thomas county.

1557. *Ipomœa* PURPUREA Lam. Common morning glory. Escaped to cultivated grounds. Richardson county, August 26.

141. POLEMONIACEÆ. (POLEMONIUM FAMILY.)

609. GILIA Ruiz. & Pav.

1558. *Gilia aggregata* Spreng. West Nebraska. (Coulter's Manual, p. 249.)

1559. *Gilia iberidifolia* Benth. Nebraska. (Coulter's Manual, p. 251.)

1560. *Gilia longiflora* (Gray) Don. (*Collomia longiflora* Gray.) Sand hills. July–September. Long Pine; Crawford.

1561. *Gilia pumila* Nutt. Dry, rocky ridges; not uncommon. Belmont; Hat Creek basin; Long Pine.

1562. *Gilia* TRICOLOR Benth. Roadsides, etc.; escaped. June. Lincoln.

610. PHLOX L. Phlox.

1563. *Phlox douglasii* Hook. High, rocky ridges, etc.; not uncommon. May–July. Valentine; Hat Creek basin.

1564. *Phlox douglasii* Hook. var. *longifolia* Gray. West Nebraska. (Coulter's Manual, p. 248.)

1565. *Phlox divaricata* L. Wild phlox. Woods, etc.; common. May–June. Weeping Water; Peru; Richardson county.

1566. *Phlox hoodii* Richards. Gordon. U.

1567. *Phlox pilosa* L. Prairie phlox. Prairies and edges of woods; common. May. Weeping Water; Richardson county; Omaha.

142. HYDROPHYLLACEÆ. (WATER-LEAF FAMILY.)

611. Ellisia L.

1568. *Ellisia nyctelea* L. (Includes *E. ambigua* Nutt.) Damp, shaded places; common. May–June. Lincoln; Peru; Weeping Water; Crete; Fairbury.

612. Hydrophyllum L. Water-leaf.

1569. *Hydrophyllum virginicum* L. Water-leaf. Woods; common. May. Weeping Water; Peru.

143. BORRAGINACEÆ. (BORAGE FAMILY.)

613. Echium L.

1570. *Echium* VULGARE L. Blue-weed. Waste places; rare. June. Weeping Water; Lincoln.

614. Lithospermum L. Gromwell; puccoon.

1571 *Lithospermum angustifolium* Michx. (Includes *L. longiflorum* Spreng.) Long-flowered puccoon. Prairies; common. May. Lincoln; Fairbury; Peru; Crete; Valentine; Weeping Water; Beaver City.

1572. *Lithospermum canescens* (Michx.) Lehm. Hoary puccoon, or alkanet. Edges of woods; common. May. Weeping Water; Peru; Otoe county.

1573. *Lithospermum hirtum* Lehm. Hairy puccoon. Low prairies; common. May–June. Weeping Water; Antelope county; Pierce; Fremont; Anselmo.

615. Onosmodium Michx. False gromwell.

1574. *Onosmodium carolinianum* DC. Banks and hillsides; not uncommon. June. Lincoln.

1575. *Onosmodium carolinianum* DC. var. *molle* Gray. Weeping Water. W.

616. Mertensia Roth.

1576. *Mertensia virginica* (L.) DC. "*Blue-bell.*" Virginia cowslip or lungwort. In damp woods; rare. May. Culbertson. U.

617. Krynitzkia Fisch. & Meyer. (*Eritrichium* Benth. & Hook.)

1577. *Krynitzkia crassisepala* (Torr. & Gray) Gray. Dry prairies. Belmont; Cherry county.

1578. *Krynitzkia glomerata* (DC.) Gray. Dry gulches and prairies, common. Crawford; Belmont.

618. Echinospermum Swartz. Stickseed.

1579. *Echinospermum* LAPPULA (L.) Lehm. Roadsides and waste places; rather rare. Introduced. Lincoln; Weeping Water.

1580. *Echinospermum redowskii* Lehm. On prairies, common. May. Lincoln; Culbertson.

1581. *Echinospermum redowskii* Lehm. var. *cupulatum* Gray. Nebraska. (Coulter's Manual, p. 259.)

1582. *Echinospermum virginianum* (L.) B. S. P. (*Cynoglossum morisoni* DC.) Beggar's lice. Dakota county; Weeping Water. U.

619. Heliotropium L. Heliotrope.

1583. *Heliotropium curassavicum* L. Saline soil; banks of Grand Lake. Alliance, August 6.

1584. *Heliotropium convolvulaceum* Gray. Sandy places. Nebraska. (Coulter's Manual, p. 258.)

144. SOLANACEÆ. (NIGHTSHADE FAMILY.)

620. DATURA L. Jamestown-weed; thorn-apple.

1585. *Datura* STRAMONIUM L. Common stramonium, or thorn-apple. Waste places, common. July–August. Introduced. Lincoln; Weeping Water; Peru; Tecumseh (large patches).

621. LYCIUM L.

1586. *Lycium* VULGARE (Ait.) Dunal. Matrimony-vine. Escaped. May–June. Weeping Water; Lincoln.

622. PHYSALIS L. Ground cherry.

1587. *Physalis angulata* L. Cultivated grounds. Fairbury; Weeping Water. U.

1588. *Physalis lanceolata* Michx. (*P. pennsylvanica* of Gray's Manual.) Waste places, common. July. Lincoln; Weeping Water; Crete.

1589. *Physalis lanceolata* Michx. var. *lævigata* Gray. Nebraska. (Coulter's Manual, p. 270.)

1590. *Physalis pubescens* L. Fields, common. July–August. Lincoln; Peru; Weeping Water.

1591. *Physalis virginiana* Mill. (*P. viscosa* Gray, not L.) Waste places, yards, etc., common. June–July. Lincoln; Peru; Crete; Weeping Water.

1592. *Physalis virginiana* Mill. var. *ambigua* Gray. Long Pine. July. B.

623. SOLANUM L. Nightshade.

1593. *Solanum carolinense* L. Horse-nettle. Waste places; not uncommon. June–August. Lincoln; Peru; Weeping Water.

1594. *Solanum nigrum* L. Common nightshade. .Shady places; common. July–September. Lincoln; Fairbury; Weeping Water.

1595. *Solanum rostratum* Dunal. Buffalo bur. Waste places, roadsides, etc.; common. July–September. Lincoln; Oxford; Crete; Fairbury; Milford; Omaha; Louisville; Weeping Water; Alliance; Otoe county.

1596. *Solanum triflorum* Nutt. Prairies, not uncommon. West Point; Crete; Lincoln; Thedford. This usually inhabits places where the sod has been more or less distributed, as in and around prairie-dog towns.

145. SCROPHULARIACEÆ. (FIGWORT FAMILY.)

624. CASTILLEJA L. f. Painted cup.

1597. *Castilleja minor* Gray. Nebraska. (Coulter's Manual, p. 283.)

1598. *Castilleja sessiliflora* Pursh. Prairies; rare. May. Peru; Long Pine; Fort Robinson.

625. GERARDIA L. Gerardia.

1599. *Gerardia aspera* Dougl. Prairies, etc.; rare. Fairbury; Long Pine; Weeping Water; Nuckolls county. U.

1600. *Gerardia purpurea* L. Purple gerardia. Prairies; common. August–September. Lincoln; Peru; Crete; Seward county.

1601. *Gerardia tenuifolia* Vahl. Slender gerardia. Prairies; rare. July. Antelope county.

627. ORTHOCARPUS Nutt.

1602. *Orthocarpus luteus* Nutt. Prairies. Belmont, July 27; Hat Creek basin, August 1.

628. VERONICA L. Speedwell.

1603. *Veronica anagallis* L. Water speedwell. Wet places. Long Pine, May. U

1604. *Veronica americana* Schw. Water speedwell. Edges of water. Belmont, July 6; Thedford, July 10; Dismal river in Thomas county, July 12; Hat Creek basin, August 1.

1605. *Veronica peregrina* L. Neckweed; purslane speedwell. Waste places; common. Lincoln, May.

1606. *Veronica virginica* L. Culver's root; Culver's physic. Waste places. July. Peru; Richardson county.

628½. SYNTHYRIS Benth.

1606½. *Synthyris rubra* (Hook.) Benth. Fort Robinson. May, 1890. (Collector, Rev. J. M. Bates.) U.

629. ILYSANTHES Raf. Pimpernel.

1607. *Ilysanthes gratioloides* (L.) Benth. False pimpernel. Low, wet grounds; common. June. Lincoln; Weeping Water.

630. HERPESTIS Gærtn. f. Herpestis.

1608. *Herpestis rotundifolia* Pursh. Ponds; rare. July. Lincoln.

631. MIMULUS L. Monkey flower.

1609. *Mimulus jamesii* Torr. & Gray. In wet places, common westward. May–July. Anselmo, July 6; Thedford, July 11; Alliance, August 6; Long Pine, May.

1610. *Mimulus ringens* L. Banks of creeks, rare. August. Lincoln.

632. PENTSTEMON Mitchell. Beard tongue.

1611. *Pentstemon albidus* Nutt. Nebraska. (Gray's Manual, p. 382.)

1612. *Pentstemon cæruleus* Nutt. Prairies. Antelope county; Hitchcock county; Long Pine; Valentine.

1613. *Pentstemon cobæa* Nutt. Prairies, common. June. Lincoln; Fairbury.

1614. *Pentstemon glaber* Pursh. Prairies, common. June–July. Lincoln; Peru; Crete; Fairbury; Alliance; Belmont.

1615. *Pentstemon grandiflorus* Nutt. Prairies, common. June–July. Lincoln; Peru; Anselmo.

1616. *Pentstemon gracilis* (Gray) Nutt. Prairies. August. Antelope county; Long Pine.

633. SCROPHULARIA L. Figwort.

1617. *Scrophularia nodosa* L. var. *marilandica* (L.) Gr. Damp woods, river banks, etc., common. July–August. Lincoln; Crete; Weeping Water; Belmont.

634. LINARIA Juss. Toad flax.

1618. *Linaria* VULGARIS Mill. Toad flax; butter-and-eggs; ramsted. Waste places, rare. Peru, June.

635. VERBASCUM L. Mullein.

1619. *Verbascum* THAPSUS L. Common mullein. Waste places, roadsides, etc. Peru; Milford; Lincoln; Weeping Water. (Nat. from Europe.)

146. ACANTHACEÆ. (ACANTHUS FAMILY.)

636. RUELLIA L. Ruellia.

1620. *Ruellia ciliosa.* Pursh. Roadsides, not uncommon. August. Lincoln.

147. OROBANCHACEÆ. (BROOM-RAPE FAMILY.)

637. APHYLLON Mitchell. Cancer-root; naked broom-rape.

1621. *Aphyllon ludovicianum* Gray. Sandy prairies, common. Alliance, August 6; Thedford, August 7; Hat Creek basin, August 1; Belmont, July 25; Arapahoe.

1622. *Aphyllon uniflorum* (L.) Gray. One-flowered cancer-root. Damp woods and prairies, rare. May–June. Lincoln; Crete.

1622½. *Aphyllon fasciculatum* Gray. On roots of some *composite* (?). Alliance, August 6.

148. LENTIBULACEÆ. (BLADDERWORT FAMILY.)

638. UTRICULARIA L. Bladderwort.

1623. *Utricularia minor* L. Smaller bladderwort. In ponds, extending out of the water, somewhat on the wet bank; rare. Thedford, July 14.

1624. *Utricularia vulgaris* L. (Includes var. *americana* Gr.) Greater bladderwort. In ponds, not very common. July. Lincoln; Thedford.

149. LABIATÆ. (MINT FAMILY.)

639. TEUCRIUM L. Germander.

1625. *Teucrium canadense* L. American germander; wood sage. Roadsides and open woods; common. July–August. Lincoln; Weeping Water.

1626. *Teucrium occidentale* Gray. Prairies; common westward. Alliance; Weeping Water. Distinguished from the preceding by the character of the calyx—villous with viscid hairs, three upper lobes acute, or the middle one acuminate instead of very obtuse, as in *T. canadense.*

640. LEONURUS L. Motherwort.

1627. *Leonurus* CARDIACA L. Common motherwort. August. Weeping Water.

641. STACHYS L. Hedge-nettle.

1628. *Stachys aspera* Michx. (*S. palustris* L. var. *aspera* Gray.) Lincoln.

642. PHYSOSTEGIA Benth. False dragon-head.

1629. *Physostegia virginiana* (L.) Benth. Banks of streams; common. July–September. Lincoln; Peru.

643. BUNELLA L. Self-heal.

1630. *Bunella vulgaris* L. Common self-heal or heal-all. Wet wood banks, Richardson county, August 25; low wet prairies, Thedford, July 15.

644. SCUTELLARIA L. Skullcap.

1631. *Scutellaria lateriflora* L. Mad-dog skullcap. Wet, shaded places; common. July–September. Lincoln; Weeping Water; Louisville.

1632. *Scutellaria parvula* Michx. Little skullcap. Prairies and roadsides; not uncommon. May–June. Lincoln; Weeping Water.

1633. *Scutellaria resinosa* Torr. Nebraska. (Coulter's Manual, p. 298.)

645. NEPETA L. Cat-mint.

1634. *Nepeta* CATARIA L. Catnip. Woods, etc.; not yet common, but rapidly spreading. July. Lincoln; Weeping Water; Peru. (Introduced.)

1635. *Nepeta* HEDERACEA (L.) B. S. P. (*N. glechoma* Benth.) Gill. Ground ivy. Escaped. May. Peru; Richardson county.

646. LOPHANTHUS Benth. Giant hyssop.

1636. *Lophanthus anisatus* Benth. Nebraska. (Coulter's Manual, p. 298.)

1637. *Lophanthus nepetoides* (L.) Benth. Borders of woods; not uncommon. July. Weeping Water; Lincoln; Crete; Dakota county.

647. MONARDA L. Horse-mint.

1638. *Monarda citriodora* Cerv. Prairie bergamot. Prairies; common in central and western Nebraska. July–August. Broken Bow, July 4; Anselmo, July 6; Belmont, July 27; Hat Creek basin, August 2; Fort Robinson, July 29.

1639. *Monarda fistulosa* L. Wild bergamot. Banks of streams; common. July–August. Lincoln; Weeping Water; Peru; Otoe county; Belmont; Hat Creek basin.

648. SALVIA L. Sage.

1640. *Salvia azurea* Lam. Tall sage. Prairies, common. July. Lincoln; Crete; Fairbury; Weeping Water; Seward.

1641. *Salvia lanceolata* Willd. Roadsides, common. June–July. Lincoln; Peru; Alliance.

1642. *Salvia urticifolia* L. Nettle-leaved sage. Weeping Water. W.

649. HEDEOMA Pers. Mock pennyroyal.

1643. *Hedeoma drummondii* Benth. Dry prairies. July–August. Belmont, July 24; Cheyenne county, August.

1644. *Hedeoma hispida* Pursh. Low prairies, common. June–July. Lincoln; Crete; Fairbury; Weeping Water.

1645. *Hedeoma pulegioides* (L.) Pers. American pennyroyal. Woods. Richardson county, near Arago, August 23.

650. PYCNANTHEMUM Michx.

1646. *Pycnanthemum virginicum* (L.) B. S. P. (*P. lanceolatum* Pursh.) Mountain mint; basil. Hall county; Richardson county, August 24; Dismal river in Thomas county, July 13.

651. LYCOPUS L. Water horehound; bugle weed; gypsywort.

1647. *Lycopus lucidus* Turcz. var. *americanus* Gray. Low, wet prairies. Thedford, July 14. Very similar to *L. sinuatus* Ell., from which it is distinguished by its sessile, merely sharply, and irregularly serrate leaves with ascending teeth, instead of irregularly laciniate-pinnatifid or sinuate; conspicuous subulate outer bracts; and large tubers on the subterranean runners. Teeth of leaves usually about 2–3 millimetres long.

1648. *Lycopus sinuatus* Ell. (*L. europæus* L. var. *sinuatus*) Gray. Wet places, common. July–August. Lincoln; Louisville; Weeping Water; Crete; Hat Creek basin; Thedford.

1649. *Lycopus virginicus* L. Bugle-weed. Damp woods, common. August. Lincoln; Louisville.

652. MENTHA L. Mint.

1650. *Mentha canadensis* L. Wild mint. Wet places, common. July–August. Lincoln; Weeping Water; Long Pine; Belmont, and Richardson county.

150. VERBENACEÆ. (VERVAIN FAMILY.)

653. VERBENA L. Vervain.

1651. *Verbena bipinnatifida* Nutt. Prairies, rare. July. Fort Robinson; Oxford; Broken Bow.

1652. *Verbena bracteosa* Michx. Prostrate vervain. Waste places, pastures, etc., common. June–August. Lincoln; Weeping Water; Oxford; Anselmo; Thedford; Hat Creek basin, and Saunders county.

1653. *Verbena hastata* L. Blue vervain. Waste places, pastures, etc., common. July–August. Lincoln; Peru; Weeping Water.

1654. *Verbena stricta* Vent. Hoary vervain. Prairies and waste places, common. June–August. Lincoln; Weeping Water, Peru; Crete; Fairbury; Anselmo.

1655. *Verbena urticæfolia* L. Nettle-leaved or white vervain. Pastures and waste places, common. July–September. Lincoln; Crete; Tecumseh; Weeping Water.

654. LIPPIA L. Lippia.

1656. *Lippia cuneifolia* Steud. Prairies, Phelps county.

655. PHRYMA L. Lopseed.

1657. *Phryma leptostachya* L. Woods, not uncommon. July. Lincoln; Crete; Long Pine; Louisville; Weeping Water; Anselmo; Belmont.

151. PLANTAGINACEÆ. (PLANTAIN FAMILY.)

656. PLANTAGO L. Plantain; ribwort.

1658. *Plantago eriopoda* Torr. Sidney, May. U.

1659. *Plantago elongata* Pursh. (*P. pusilla* Nutt.) Low, barren prairies. Lincoln; Weeping Water; Anselmo.

1660. *Plantago major* L. Common plantain. Yards and waste places, wooded canons. Common. Lincoln; Peru; Weeping Water; Crete; Tecumseh; Belmont; Anselmo.

1661. *Plantago patagonica* Jacq. var. *gnaphalioides* Gray. Prairies, very common. July–September. Lincoln; McCook; Crete; Fairbury; Hardy; Wymore; Weeping Water; Anselmo; Thedford.

1662. *Plantago rugelii* Decaisne. Waste places, not uncommon. Lincoln. Commonly confounded with *P. major*.

152. OLEACEÆ. (OLIVE FAMILY.)

657. FRAXINUS L. Ash.

1663. *Fraxinus pubescens* Lam. Red ash. Long Pine; Valentine. B.

1664. *Fraxinus viridis* Michx. Green ash. Banks of streams, wooded canons, common. Lincoln; Crete; Peru; Long Pine; Weeping Water; Brownville; Tecumseh; Anselmo; Belmont, and Dismal river.

1665. *Fraxinus americana?* L. White ash. Nebraska. (Gray's Manual, p. 335.)

153. GENTIANACEÆ. (GENTIAN FAMILY.)

658. GENTIANA L. Gentian.

1666. *Gentiana calycosa* Griseb. Prairies, common. September–October. Lincoln; Peru; Weeping Water; Crete; Long Pine; and Antelope county.

1667. *Gentiana puberula* Michx. Weeping Water. W.

659. EUSTOMA Salisb.

1668. *Eustoma russellianum* Griseb. Low prairies. Antelope county; Kearney county; Lincoln county; Alliance.

154. APOCYNACEÆ. (DOGBANE FAMILY.)

660. APOCYNUM L. Dogbane; Indian hemp.

1669. *Apocynum androsæmifolium* L. Spreading dogbane. Roadsides and rocky ridges. July. Cass county; Belmont.

1670. *Apocynum cannabinum* L. Indian Hemp. Roadsides and waste places, very common. July–September. Lincoln; Crete; Brownville; Weeping Water; Anselmo; Belmont; and Dakota county.

155. ASCLEPIADACEÆ. (MILKWEED FAMILY.)

661. ASCLEPIAS L. Milkweed; silkweed.

1671. *Asclepias arenaria* Torr. Prairies, common westward. Long Pine Belmont; and Dismal river, Thomas county.

1672. *Asclepias incarnata* L. Swamp milkweed. Wet places, banks of streams, common. July–August. Lincoln; Weeping Water; Long Pine; Anselmo.

1673. *Asclepias obtusifolia* Michx. Weeping Water. W.

1674. *Asclepias ovalifolia* Decaisne. Dwarf milkweed. Weeping Water. W.

1675. *Asclepias purpurascens* L. Purple milkweed. Weeping Water. W.

1676. *Asclepias speciosa* Torr. Prairies, not uncommon westward. Anselmo, July 6; Thedford, July 18.

1677. *Asclepias stenophylla* Gray. Nebraska. (Coulter's Manual, p. 241.)

1678. *Asclepias sullivantii* Engelm. Low grounds. Weeping Water; Lincoln.

1679. *Asclepias syriaca* L. (*A. cornuti* Decaisne.) Common milk weed. Everywhere a common weed. August–October. Lincoln; Peru; Crete; Tecumseh; Wymore; Weeping Water; Anselmo.

1680. *Asclepias tuberosa* L. Butterfly weed; pleurisy root. Waste places and prairies, common. July–August. Lincoln; Crete; Weeping Water; Humboldt; Fairbury; Dakota county; Douglas county.

1681. *Asclepias verticillata* L. Whorled milkweed. Prairies and waste places, common. July–August. Lincoln; Peru; Weeping Water; Fairbury.

1682. *Asclepias verticillata* L. var. *pumila* Gray. Prairies; common. McCook; Fort Robinson; Valentine; Anselmo; Belmont; Crawford; Broken Bow; Thedford.

662. **Acerates** Ell. Green milkweed.

1683. *Acerates lanuginosa* Decaisne. Prairies. Antelope county; Crete.

1684. *Acerates longifolia* Ell. Prairies and roadsides; common. Lincoln; Peru; Hastings; Crete; Weeping Water; Broken Bow; Anselmo.

1685. *Acerates viridiflora* (Raf.) Ell. Prairies; common. June–September. Lincoln; Weeping Water.

156. CAMPANULACEÆ. (CAMPANULA FAMILY.)

663. **Lobelia** L. Lobelia.

1686. *Lobelia spicata* Lam. Lobelia. Low prairies; rather uncommon. Broken Bow, July 4; Clearwater.

1687. *Lobelia syphilitica* L. Great lobelia. Wet banks of streams; common. July–September. Lincoln; Long Pine; Peru; Weeping Water; Crawford.

664. **Campanula** L. Bellflower.

1688. *Campanula americana* L. Tall bellflower. Woods. August–September. Lincoln; Peru; Weeping Water; Otoe county; Richardson county.

1689. *Campanula aparinoides* Pursh. Marsh bellflower. Wet prairies; rare. July. Lincoln; Long Pine.

1689½. *Campanula rotundifolia* L. Harebell. Rocky bluffs; common. July–August. Belmont; Hat Creek basin; Valentine.

665. **Specularia** Heister. Venus' looking-glass.

1690. *Specularia perfoliata* (L.) A. DC. Prairies and waste places; common. July. Lincoln; Crete; Fairbury; Weeping Water; Thedford; Broken Bow.

157. CUCURBITACEÆ. (GOURD FAMILY.)

666. **Sicyos** L.

1691. *Sicyos angulatus* L. One-seeded star cucumber. River banks; not very common. Lincoln.

667. **Echinocystis** Torr. & Gray.

1692. *Echinocystis echinata* (Muhl.) B. S. P. (*E. lobata* Torr & Gr.) Wild cucumber. Copses; common. August. Lincoln; Crete; Weeping Water; Tecumseh.

668. CUCURBITA L. Pumpkin; squash.

1693. *Cucurbita fœtidissima* H. B. K. (*Cucurbita perennis* Gray.) Wild pumpkin. Prairies; rare. Lincoln county. U. Root very large. Specimens have been brought to the herbarium of the university measuring 1½ metres (5 ft.) in length and about 25 cm. (10 in.) in thickness. In shape they are fusiform, like the root of the garden beet.

158. RUBIACEÆ. (MADDER FAMILY.)

669. GALIUM L. Bedstraw; cleavers.

1694. *Galium aparine* L. Cleavers; goose grass. Rich woods, common. Lincoln; Weeping Water; Crete; Anselmo; Hat Creek basin.

1695. *Galium asprellum* Michx. Rough bed straw. Woods. Weeping Water. W.

1696. *Galium bifolium* Watson. Weeping Water; Louisville. W.

1697. *Galium boreale* L. Northern bedstraw. High rocky ridges. Belmont; Hat Creek basin.

1698. *Galium circæzans* Michx. Wild liquorice. Damp woods. July. Lincoln; Louisville; Crete.

1699. *Galium concinnum* Torr. & Gray. Small bedstraw. Dry woods. Weeping Water.

1700. *Galium trifidum* L. Small bedstraw. Wet woods. Weeping Water.

1701. *Galium trifidum* L. var. *pusillum* Gray. Weeping Water. W.

1702. *Galium trifidum* L. var. *latifolium* Torr. Weeping Water. W.

1703. *Galium triflorum* Michx. Sweet scented bedstraw. Rich woods, common. July–August. Weeping Water; Long Pine; Lincoln.

670. HOUSTONIA L. Houstonia.

1704. *Houstonia angustifolia* Michx. Banks. Cass county. S.

671. CEPHALANTHUS L.

1705. *Cephalanthus occidentalis* L. Button rush. Along streams. West Point.

159. CAPRIFOLIACEÆ. (HONEYSUCKLE FAMILY.)

672. LONICERA L. Honeysuckle; woodbine.

1706. *Lonicera flava* Sims. Yellow honeysuckle. Woods. May. Peru.

1707. *Lonicera glauca* Hill. (*L. parviflora* Lam.) Small honeysuckle. Woods. May. Peru.

1708. *Lonicera sempervirens* L. Trumpet; honeysuckle. Banks of the Missouri river; Cass county. W.

673. SYMPHORICARPOS Juss. Snowberry.

1709. *Symphoricarpos occidentalis* Hook. Wolf-berry. Banks of streams, common. July. Lincoln; Crete; Long Pine; Weeping Water; Anselmo; Thedford.

1710. *Symphoricarpos racemosus* Michx. var. *pauciflorus* Robbins. High, rocky places. Hat Creek basin, August 1, 1889.

1711. *Symphoricarpos vulgaris* Michx. Indian currant; coral berry. In woods and on bank of streams, common. August. Lincoln; Tecumseh; Weeping Water.

674. TRIOSTEUM L. Fever-wort; horse-gentian.

1712. *Triosteum perfoliatum* L. Fever-wort. Edges of woods, not very common. June. Weeping Water; Lincoln; Peru; Crete.

675. VIBURNUM L. Arrow-wood.

1713. *Viburnum lentago* L. Sweet viburnum; sheep-berry. Along wooded banks of streams. May. Plattsmouth.

676. SAMBUCUS L. Elder.

1714. *Sambucus canadensis* L. Open places, etc., common. June–July. Lincoln; Table Rock; Tecumseh; Weeping Water.

160. COMPOSITÆ. (COMPOSITE FAMILY.)

677. STEPHANOMERIA Nutt.

1715. *Stephanomeria runcinata* Nutt. Nebraska. (Coulter's Manual.)

678. TRAGOPOGON L.

1716. *Tragopogon* PORRIFOLIUS L. Vegetable oyster. Roadsides, etc., not uncommon. Lincoln. Introduced.

679. LYGODESMIA Don.

1717. *Lygodesmia juncea* Don. Prairies, common. Cheyenne county; Butler county; Fort Robinson; Thedford; Anselmo; Belmont.

1718. *Lygodesmia rostrata* Gray. Sandy prairies. Thedford, July 14; Valentine.

680. SONCHUS L. Sow-thistle.

1719. *Sonchus* ASPER Vill. Waste places. Introduced. Lincoln; Weeping Water.

681. PRENANTHES L. (Includes *Nabalus* Cass.) Rattlesnake root.

1720. *Prenanthes asper* Torr. & Gr. Roadsides, not uncommon. August. Lincoln; Crete; Seward county.

682. LACTUCA L. (Includes *Mulgedium.*) Lettuce.

1721. *Lactuca canadensis* L. Wild lettuce. Waste places, etc., fields, thickets, common. Lincoln; Weeping Water.

1722. *Lactuca villosa* (Jacq.) B. S. P. (*M. acuminatum* DC.) Bottom lands. August. Lincoln.

1723. *Lactuca floridana* (L.) Gærtn. Waste places, roadsides, etc. August. Lincoln; Hastings; Weeping Water.

1724. *Lactuca ludoviciana* DC. Weeping Water. W.

1725. *Lactuca pulchella* (Nutt.) DC. Waste places, common. July. Lincoln; Fairbury; Long Pine; Weeping Water; Belmont; Hat Creek basin.

683. TARAXACUM Hall. Dandelion.

1726. *Taraxacum officinale* Web. (*T. dens-leonis* Desf.) Common dandelion. Meadows and yards, common. May. Lincoln; Peru; Crete; Weeping Water.

684. TROXIMON Nutt. False dandelion.

1727. *Troximon cuspidatum* Pursh. Prairies, not rare. May. Lincoln; Peru; Crete; Valentine; Weeping Water; Beaver City.

1728. *Troximon glaucum* (Eaton) Nutt. var. *parviflorum* (Nutt.) Gray. Nebraska. (Coulter's Manual, p. 221.)

685. MALACOTHRIX DC.

1729. *Malacothrix sonchoides* Torr. & Gr. West Nebraska. (Coulter's Manual, p. 216.)

686. HIERACIUM L. Hawkweed.

1730. *Hieracium longipilum* Torr. Nebraska. (Coulter's Manual, p. 217.)

1731. *Hieracium scabrum* Michx. Rough hawkweed. Hillsides. September. Lincoln. S.

1732. *Hieracium venosum* L. Rattlesnake-weed. Rare, in dry waste places. Lincoln. P.

687. CNICUS L. (*Cirsium* DC.) Thistle.

1733. *Cnicus altissimus* (L.) Willd. Common thistle. Waste places, common. September. Lincoln; Peru; Weeping Water.

1734. *Cnicus altissimus* (L.) Willd. var. *discolor* (Muhl.) Gray. (*C. discolor* Spreng.) Common thistle. Waste places, common. August. Lincoln.

1735. *Cnicus* ARVENSIS (L.) Hoff. Creeping or "Canada" thistle. Lincoln. U.

1736. *Cnicus* LANCEOLATUS (L.) Hoff. Weeping Water. W.

1737. *Cnicus ochrocentrus* Gray. Prairies. July. Long Pine. B.

1738. *Cnicus pitcheri* Torr. Prairies. July. Antelope county.

1739. *Cnicus undulatus* Gray. Prairies, roadsides, etc. Hastings, August 2.

688. ARCTIUM L.

1740. *Arctium* LAPPA L. (*Lappa officinalis* All.) Burdock. Waste places, yet rare. Introduced. Lincoln; Weeping Water.

1741. *Arctium* LAPPA L. var. MINUS (Schkuhr.) Gray. Peru, September.

689. CACALIA L. Indian plantain. (Placed under *Senecio* by Benth. and Hook.)

1742. *Cacalia atriplicifolia* L. Pale Indian plantain. Common along the Missouri river bluffs. July–August. Richardson county; Nebraska City.

1743. *Cacalia tuberosa* Nutt. Tuberous Indian plantain. Prairies, common. July–August. Lincoln; Crete; Weeping Water.

690. SENECIO L. Groundsel.

1744. *Senecio aureus* L. Golden ragwort. Prairies, common. May. Lincoln; Peru; Crete; Weeping Water; Fairbury.

1745. *Senecio aureus* L. var. *balsamitæ* (Muhl.) Torr. & Gr. Prairies. July. Valley county.

1746. *Senecio aureus* L. var. *compactus* Gray. Prairies. May. Valentine. U.

1746½. *Senecio canus* Hook. Fort Robinson, May, 1890. (Collected by Rev. J. M. Bates.) U.

1747. *Senecio douglasii* DC. (*S. longilobus* Benth.) Ragwort. Roadsides, and high prairies. July–August. Lincoln; Fort Robinson; Crawford; Alliance.

1748. *Senecio integerrimus* Nutt. Ragwort. High prairies. May. Lincoln.

1449. *Senecio lugens* Richards. Ragwort. Prairies, rare. May. Lincoln.

691. ERECHTITES Raf.

1750. *Erechtites hieracifolia* (L.) Raf. Fireweed. Banks of streams, rare. August. Lincoln.

692. ARTEMISIA L. Wormwood; sage brush.

1751. *Artemisia biennis* Willd. Biennial wormwood. Lincoln, August 16.

1752. *Artemisia canadensis* Michx. Wild wormwood. High rocky ridges. Hat Creek basin, August 2.

1753. *Artemisia cana* Pursh. High prairies, not uncommon. Hat Creek basin; Crawford.

1754. *Artemisia dracunculoides* Pursh. Wormwood. River banks, common. August–September. Lincoln; Weeping Water.

1755. *Artemisia filifolia* Torr. Wormwood. Prairies, common. Box Butte county; Fort Robinson.

1756. *Artemisia frigida* Willd. Wild sage. Prairies. July–September.

Box Butte county; Long Pine; Fort Robinson; Belmont; Hat Creek basin.

1757. *Artemisia longifolia* Nutt. Prairies. July. Chadron. B.

1758. *Artemisia ludoviciana* Nutt. Wormwood; western mugwort. Prairies, very common. Lincoln; Long Pine; Weeping Water; Anselmo.

1759. *Artemisia tridentata* Nutt. Sage brush; sage wood; mountain sage. Common on very high prairies and rocky banks, in "bad lands." Hat Creek basin, August 1.

693 CHRYSANTHEMUM L.

1760. *Chrysanthemum* LEUCANTHEMUM L. (*Leucanthemum vulgare* Lam.) Ox-eye; daisy or whiteweed. Lincoln.

694. ANTHEMIS L. Chamomile.

1761. *Anthemis* ARVENSIS L. Corn chamomile. Introduced. Weeping Water. W.

1762. *Anthemis* COTULA L. (*Maruta cotula* DC.) Common Mayweed. Introduced. Waste places; common. May–July. Lincoln; McCook; Thedford.

695. ACHILLEA L. Yarrow.

1763. *Achillea millefolium* L. Prairies; common. May–July. Lincoln; Fairbury; Peru; Weeping Water; Hat Creek basin.

696. CREPIS L.

1764. *Crepis glauca* Torr. & Gr. Nebraska. (Coulter's Manual, p. 219.)

1765. *Crepis occidentalis* Nutt. Prairies. Nebraska. (Coulter's Manual, p. 219.)

697. ACTINELLA Nutt.

1766. *Actinella acaulis* (Pursh.) Nutt. On dry, rather stony and barren hills, common. June–August. Harrison; Belmont; Hat Creek basin. Altitude 4,600–5,200 feet. Leaves not punctate as in *A. scaposa*; pappus of 5–7 scales instead of 5, and whole plant more densely canescent.

698. DYSODIA Cav. Fetid marigold.

1767. *Dysodia chrysanthemoides* Lag. Waste places, roadsides; very common. July–August. Lincoln; Crete; Tecumseh; Weeping Water.

699. POLYPTERIS Nutt.

1768. *Polypteris hookeriana* Gray. Nebraska. (Coulter's Manual, p. 194.)

700. BAHIA Lag.

1769. *Bahia oppositifolia* Nutt. Dry prairies. Hat Creek basin, August 2.

701. HYMENOPAPPUS L'Her.

1770. *Hymenopappus corymbosus* T. & G. Nebraska. (Gray's Manual, p. 286.)

1771. *Hymenopappus filifolius* Hook. Prairies; common. Antelope county; Fort Robinson; Belmont.

1772. *Hymenopappus tenuifolius* Pursh. Open prairies. May. Fairbury. U.

702. BIDENS L. Bur marigold.

1773. *Bidens bipinnata* L. "Spanish needles." Weeping Water. W.

1774. *Bidens cernua* L. Smaller bur marigold. Banks of streams; not very common. August–September. Roca.

1775. *Bidens connata* Muhl. Swamp beggar-ticks. Weeping Water. W.

1776. *Bidens frondosa* L. Common beggar-ticks. Waste places; common. August. Lincoln; Seward county.

1777. *Bidens lævis* (L.) B. S. P. (*B. chrysanthemoides* Michx.) Wet grounds. September. Lincoln.

703. THELESPERMA Less.

1778. *Thelesperma gracile* Gray. Prairies; rare. Fairbury, June; Dismal river in Thomas county, July 13.

704. COREOPSIS L. Tickseed.

1779. *Coreopsis palmata* Nutt. Prairies and waste places. Richardson county; Weeping Water.

1780. *Coreopsis tinctoria* Nutt. Prairies, common. July. Lincoln; Hastings; Nebraska City; Aurora.

1781. *Coreopsis verticillata* L. High prairies, not uncommon. July–August. Fillmore county; Weeping Water; Alliance; Crawford.

705. ACTINOMERIS Nutt.

1782. *Actinomeris alternifolia* (L.) DC. (*A. squarrosa* Nutt.) Woods, common. August. Lincoln; Weeping Water.

706. HELIANTHUS L. Sunflower.

1783. *Helianthus annuus* L. Common sunflower. Waste places, very common. August–October. Lincoln; Oxford; Crete; Tecumseh; Brownville; Long Pine; Weeping Water.

1784. *Helianthus hirsutus* Raf. Weeping Water. W.

1785. *Helianthus divaricatus* L. Weeping Water. W.

1786. *Helianthus giganteus* L. Roadsides. August. Lincoln.

1787. *Helianthus grosse-serratus* Martens. Roadsides and waste places, common. September. Crete; Tecumseh; Weeping Water.

1788. *Helianthus lætiflorus* Pers. Prairies, and waste places, not uncommon. September. Lincoln, and Antelope county.

1789. *Helianthus maximiliani* Schrader. Waste places, common. August. Lincoln; Long Pine; Hastings; Weeping Water.

1790. *Helianthus orgyalis* DC. Dry prairies. Nebraska. (Coulter's Manual, p. 186.)

1791. *Helianthus petiolaris* Nutt. Prairies, common. July–August. Dismal river, in Thomas county; Belmont; Broken Bow; Hat Creek basin.

1792. *Helianthus petiolaris* Nutt. var. *canescens* Gray. Nebraska. (Gray, Syn. Fl. of N. A., vol. I, part 2, p. 272.)

1793. *Helianthus rigidus* Desf. Prairies, common. August–October. Lincoln; Weeping Water; Crete.

1794. *Helianthus tuberosus* L. (Includes *H. doronicoides* T. & G., not Lam.) Roadsides, waste places, etc. Wymore; Weeping Water.

707. LEPACHYS Raf. Cone-flower.

1795. *Lepachys pinnata* Torr. & Gr. Dry prairies and waste places. July. Peru; Weeping Water.

1796. *Lepachys columnaris* (Pursh.) Torr. & Gr. Prairies, common. July–September. Lincoln; Arapahoe; Fairbury; Hastings; Belmont; Anselmo.

1797. *Lepachys columnaris* (Pursh.) Torr. & Gr. var. *pulcherrima* (DC.) Torr. & Gr. Prairies, etc. July. Antelope county; Arapahoe; Belmont.

708. RUDBECKIA L. Cone-flower.

1798. *Rudbeckia hirta* L. Prairies, not uncommon. Lincoln; Aurora; Thedford; Belmont.

1799. *Rudbeckia laciniata* L. Open woods, common. August. Lincoln; Weeping Water.

709. ECHINACEA Mœnch. Purple cone-flower.

1800. *Echinacea angustifolia* DC. Purple cone-flower. "Nigger-head." Prairies, common. August–October. Crete; Weeping Water; Lincoln; Anselmo.

710. HELIOPSIS Pers. Ox-eye.

1801. *Heliopsis scabra* Dunal. Prairies, common. July–August. Lincoln; Weeping Water; Peru.

711. XANTHIUM L.

1802. *Xanthium canadense* Mill. Cockle-bur. Fields and waste places, too common. July–Sept. Lincoln; Crete.

1803. *Xanthium* STRUMARIUM L. Cockle-bur. Introduced. Weeping Water. W.

712. FRANSERIA Cav.

1804. *Franseria discolor* Nutt. Nebraska. (Coulter's Manual, p. 181.)

713. AMBROSIA L. Ragweed.

1805. *Ambrosia artemisiæfolia* L. Roman wormwood; hog-weed; bitter-weed. Waste places, common. September. Lincoln; Tecumseh; Weeping Water.

1806. *Ambrosia psilostachya* DC. Roadsides, etc., rare. Lincoln; Crete; Weeping Water.

1807. *Ambrosia trifida* L. Great ragweed. Too common in waste and cultivated fields. August–September. Lincoln; Crete; Tecumseh; Weeping Water.

714. IVA L. Marsh elder; highwater shrub.

1808. *Iva ciliata* Willd. Roadsides, common. Lincoln.

1809. *Iva xanthiifolia* Nutt. Waste places, not uncommon. September. Lincoln.

715. SILPHIUM L. Rosin-weed.

1810. *Silphium integrifolium* Michx. Rosin-weed. July–August. Lincoln; Weeping Water; Crete.

1811. *Silphium laciniatum* L. Compass plant; rosin-weed Low prairies, common. August–October. Lincoln; Peru; Eagle; Weeping Water.

1812. *Silphium perfoliatum* L. Cup-plant. River banks, common. July-September. Lincoln; Peru; Tecumseh; Weeping Water.

1813. *Silphium trifoliatum* L. Weeping Water. W.

715½. GNAPHALIUM L.

1813½. *Gnaphalium palustre* Nutt. Low banks of the Platte river. Camp Clarke, Cheyenne county, August 26, 1889. (J. G. Smith.) U.

716. ANTENNARIA Gærtn. Everlasting.

1814. *Antennaria plantaginifolia* (L.) Hook. Everlasting; ladies' tobacco. Lincoln; Peru; Fairbury; Crete; Weeping Water.

717. ERIGERON L. Fleabane.

1815. *Erigeron annuus* (L.) Pers. Daisy fleabane; sweet scabiosa. Weeping Water; Louisville.

1816. *Erigeron bellidiastrum* Nutt. Roadsides in canons, rare. Hat Creek Creek basin, August 1.

1817. *Erigeron canadensis* L. Horseweed, or butterweed. Waste places, common. August–October. Lincoln; Weeping Water; Crete; Long Pine.

1818. *Erigeron divaricatus* Michx. Dwarf fleabane. Waste places, common. July–September. Lincoln; Weeping Water; Thedford.

1819. *Erigeron divergens* Torr. & Gr. Hitchcock county; Cheyenne county; Belmont.

1820. *Erigeron philadelphicus* L. Common fleabane. Peru; Weeping Water; Long Pine; Anselmo.

1821. *Erigeron ramosus* (Walt.) B. S. P. (*E. strigosus* Muhl.) Daisy fleabane. Prairies, very common. Lincoln; Weeping Water.

718. ASTER L. Aster.

1822. *Aster angustus* Torr. & Gr. Low prairies, rather common. Lincoln.

1823. *Aster canescens* Pursh. High prairies. Hat creek basin, Sioux county, August 1, 1889.

1824. *Aster commutatus* Torr. & Gray. Fairbury; Belmont, July 24.

1825. *Aster cordifolius* L. Weeping Water. W.

1826. *Aster drummondii* Lindl. Weeping Water. W.

1827. *Aster lævis* L. (Including *A. cyaneus* Hoffm. and *A. lævigatus* Hook.) Weeping Water; Lincoln.

1828. *Aster macrophyllus* L. Wooded banks, common. August–September, Lincoln; Peru.

1829. *Aster multiflorus* Ait. Roadsides, etc., common. Lincoln; Weeping Water; Geneva; Hastings; Long Pine.

1830. *Aster novæ-angliæ* L. New England Aster. Peru. September.

1830½. *Aster novi-belgii* L. (*A. longifolius* of Gray's Manual, fifth edition.) Weeping Water. W.

1831. *Aster oblongifolius* Nutt. Prairies, common. Lincoln; Fairbury; Weeping Water; Antelope county.

1832. *Aster patens* Ait. Prairies. August. Antelope county.

1833. *Aster sagittifolius* Willd. Dry grounds. August. Lincoln; Weeping Water.

1834. *Aster salicifolius* Ait. (Includes *A. carneus* Nees. in part.) Long Pine; Weeping Water. B.

1835. *Aster sericeus* Vent. Dry prairies, common. October. Lincoln; Peru; Weeping Water.

1836. *Aster tanacetifolius* (Nees.) H. B. K. Nebraska. (Coulter's Manual, p. 168.)

1837. *Aster turbinellus* Lindl. Weeping Water. W.

1838. *Aster undulatus* L. Lincoln. P.

719. BOLTONIA L'Her.

1839. *Boltonia glastifolia* L'Her. Low places, common. Lincoln; Weeping Water.

1840. *Boltonia asteroides* L'Her. Weeping Water. W.

720. TOWNSENDIA Hook.

1841. *Townsendia grandiflora* Nutt. Prairies and high rocky ridges, common. Antelope county; Hitchcock county; Fort Robinson; North Platte; Belmont; Hat Creek basin.

721. SOLIDAGO L. Golden rod.

1842. *Solidago arguta* Ait. River banks, common. July–Septembr. Lincoln; Peru; Crete; Tecumseh; Weeping Water.

1843. *Solidago canadensis* L. Our most common golden rod. Everywhere. July–October. Peru; Lincoln; Seward county; Hastings; Weeping Water; Tecumseh.

1844. *Solidago canadensis* L. var. *scabra* (Muhl.) Torr. & Gr. Fairbury, September. U.

1845. *Solidago caroliniana* (L.) B. S. P. (*S. tenuifola* Pursh.) Prairies, common. Lincoln; Long Pine.

1846. *Solidago humilis* Pursh. Prairies, September. Lincoln.

1847. *Solidago lanceolata* L. Prairies. Weeping Water; Lincoln. W. & P.

1848. *Solidago missouriensis* Nutt. Weeping Water. W.

1849. *Solidago missouriensis* Nutt. var. *montana* Gr. Highlands, etc. July. Fort Robinson. U.

1850. *Solidago nemoralis* Ait. High prairies. July–August. Lincoln; Weeping Water.

1851. *Solidago rigida* L. Prairies, very common. August–September. Lincoln; Peru; Weeping Water; Crete; Long Pine; Tecumseh.

1852. *Solidago rupestris* Raf. Prairies, common. July-September. Lincoln; Weeging Water; and Dismal River in Thomas county.

1853. *Solidago scrotina* Ait. Fort Robinson, B.; Weeping Water, W.

1854. *Solidago speciosa* Nutt. var. *angustata* Torr. & Gr. Weeping Water. W.

1855. *Solidago speciosa* Nutt. var. *rigidiuscula* Torr. & Gr. Low prairies. September. Lincoln; Crete.

1856. *Solidago ulmifolia* Muhl. Woods, etc. Richardson county, August 25. (Disagrees in having smooth achenes.)

722. BIGELOVIA DC. Rayless golden rod.

1857. *Bigelovia graveolens* Gray. Barren, denuded places, banks, etc. Hat Creek basin, August 2.

723. HAPLOPAPPUS Cass.

1858. *Happlopappus spinulosus* DC. Prairies. June–July. Fairbury; Cambridge; Hardy; Kearney; Antelope county; Anselmo; Thedford; Belmont.

724. CHRYSOPSIS Nutt. Golden aster.

1859. *Chrysopsis villosa* (Pursh.) Nutt. Prairies, common. Dismal river in Thomas county, July 13; Alliance, July 15; Belmont, July 25.

725. GRINDELIA Willd. Gum plant.

1860. *Grindelia squarrosa* Dunal. Fetid gum plant. Roadsides, etc.; very common. September-October. Lincoln; Weeping Water; Belmont.

726. GUTIERREZIA Lag.

1861. *Gutierrezia euthamiæ* Torr. & Gr. Prairies; common. Belmont, July 27; Hat Creek basin, August 1.

727. LIATRIS Schreb. Blazing star.

1862. *Liatris punctata* Hook. Prairies; common. August–September. Peru; Crete; Lincoln; Fairbury; Fort Robinson; Weeping Water; Polk county; Seward county; Thedford; Anselmo.

1863. *Liatris pycnostachya* Michx. Prairies, etc. August. Lincoln; Dakota county. (Frequently confounded with *L. spicata*.)

1864. *Liatris scariosa* (L.). Willd. Prairies; common. August–September. Lincoln; Crete; Weeping Water; Seward.

1865. *Liatris squarrosa* Willd. Prairies. September. Polk county.

728. KUHNIA L.

1866. *Kuhnia eupatorioides* L. Prairies, common. August–September. Lincoln; Weeping Water; Long Pine; Peru; Crete; Seward; Belmont.

1867. *Kuhnia eupatoriodes* L. var. *corymbulosa* Torr. & Gray. Nebraska. (Coulter's Manual, p. 143.)

729. **EUPATORIUM** L. Thoroughwort.

1868. *Eupatorium ageratoides* L. White snakeroot. Woods; common. July–August. Peru; Crete; Lincoln; Seward; Weeping Water; Dakota county.

1869. *Eupatorium altissimum* L. Thoroughwort. Waste places; not common. August. Lincoln.

1870. *Eupatorium perfoliatum* L. Boneset. Pastures, low prairies, etc. July–August. Plattsmouth; Thedford; Anselmo.

1871. *Eupatorium purpureum* L. Joe-Pye weed. Waste places, woods, etc. common. Dakota county; Antelope county; Thomas county; Anselmo; Richardson county. July–September.

730. **VERNONIA** Schreb. Iron weed.

1872. *Vernonia fasciculata* Michx. Iron weed. Low prairies and waste places; very common. Lincoln; Peru; Crete; Long Pine; Nebraska City; Hastings; Tecumseh; Weeping Water.

NOTE.—Eighteen species not indicated in the above numbering have been inserted under their respective genera as half numbers in preference to adding them as an appendix.

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